A Guide to
INVASIVE PLANTS
in Massachusetts

$5.00

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Authors:

Paul Somers
Massachusetts Division of Fisheries and Wildlife,
Natural Heritage & Endangered Species Program

Rachel Kramer, Karen Lombard
The Nature Conservancy

Bill Brumback
New England Wild Flower Society

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IPANE = Invasive Plant Atlas of New England
NEWFS = New England Wild Flower Society
NHESP = Natural Heritage & Endangered Species Progam
MassWildlife = Massachusetts Division of Fisheries and Wildlife
TNC = The Nature Conservancy

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Japanese Barberry by Bill Byrne, *MassWildlife*

Introduction

The natural diversity of Massachusetts is composed of many interconnected groups of native plants, animals, fungi, and microorganisms. Although plants have been moving around our landscape and adapting to new environments since the glaciers receded over 10,000 years ago, humans have increased the rate of plant movement and have introduced many new plant species to the state. Most introduced plants do not threaten our native plant and animal communities, but some non-native plants spread rapidly in our natural areas, thrive in a variety of habitat types, and are difficult to remove or control. With the exception of direct habitat destruction, these invasive species pose the greatest threat to the native biodiversity of Massachusetts. The goal of this guide is to introduce 66 plant species that are considered invasive in our native ecosystems or that could become established pests in the Commonwealth.

What are invasive plants?

Invasive plants are non-native species that have spread into native or minimally managed plant systems in Massachusetts. These plants cause economic or environmental harm by developing self-sustaining populations that dominate and/or disrupt native ecosystems. Invasives have left behind the herbivores and diseases that typically control their populations in their native habitats, and they have reproductive mechanisms that allow them to rapidly grow, mature, and spread. Apart from forming dense stands that crowd or shade-out natives, certain invasive species can alter ecosystem processes such as hydrology, soil chemistry, and the frequency of natural fires.

The Massachusetts Invasive Plant Advisory Group (MIPAG) has identified 66 "Invasive," "Likely Invasive" or "Potentially Invasive" plant species in this guide. In order to be included here, every species had to meet specific criteria (see below) substantiated by scientific investigation. The review process is ongoing and may result in additions, deletions, or changes in status pending new data and further review. Please note that "species" includes all synonyms, subspecies, varieties, forms, and cultivars of that species unless proven otherwise by a process of

scientific evaluation. Definitions of the three MIPAG categories of invasiveness are as follows:

Invasive

An *invasive* is a nonindigenous plant with the biologic potential for rapid and widespread dispersion and establishment in minimally managed habitats. These species have the potential for dispersal over spatial gaps away from the site of introduction, and have the potential for survival in high numbers away from intensively managed artificial habitats. Invasive plants have become naturalized (persisting without cultivation) in Massachusetts and are widespread, or at least common, in a region or habitat type(s) in the state. Within minimally managed habitats, they have many occurrences of numerous individuals that form dense stands and are able to outcompete other species in natural plant communities.

Likely Invasive

A *likely invasive* is a non-native species that is naturalized in Massachusetts, but does not meet the full criteria that would trigger an *invasive* designation. In general these plants have the same qualities as *invasive* plants except that they are not yet widespread in Massachusetts. *Likely invasive* plants must have at least one occurrence in the state, and have the potential, based on their biology and colonization histories in other states to become *invasive* in Massachusetts. Plants may also be placed in this category if they have been acknowledged as *invasive* in nearby states but their status in Massachusetts is uncertain due to lack of field information or taxonomic uncertainties.

"Potentially Invasive"

The species classified as *potentially invasive* are not currently known to exist in Massachusetts, but can be expected to become invasive within minimally managed habitats in the future. *Potentially invasive* species have documented histories of invasiveness in other areas of the Northeast, and their naturalization in Massachusetts is anticipated. These species have the biological capacity, if naturalized, to pose an imminent threat to the biodiversity of Massachusetts.

Reed Canary-grass by Leslie Mehrhoff, IPANE

MIPAG Criteria for Evaluating Non-Native Plant Species for Invasiveness in Massachusetts

The Massachusetts Invasive Plant Advisory Group (MIPAG) defines invasive plants as *"non-native species that have spread into native or minimally managed plant systems in Massachusetts. These plants cause economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems."* As defined here, "species" includes all synonyms, subspecies, varieties, forms, and cultivars of that species unless proven otherwise by a process of scientific evaluation.

The following criteria have been used to objectively evaluate and categorize plant species suspected of being, or with the potential to become, invasive in Massachusetts. These criteria were developed by Les Mehrhoff at the University of Connecticut and a MIPAG subcommittee representing science, nursery, and conservation professionals.

For a species to be included on the list of "Invasive," "Likely Invasive" or "Potentially Invasive" plants in Massachusetts, it must be substantiated by scientific investigation (including herbarium specimens, peer-reviewed papers, published records and other data available for public review) to meet specific criteria. The process of reviewing individual plant species for their invasiveness in Massachusetts is ongoing and may result in a change in status pending new data and further review.

Summary of criteria:

	Criteria that must be met
Base criteria	1-4
Invasive	1-9
Likely Invasive	1-5, at least one of 6-9, at least one of 10-12
Potentially Invasive	1-4, (not 5), 13-15

For a species to be designated "INVASIVE", "LIKELY INVASIVE" or "POTENTIALLY INVASIVE" it must meet certain base criteria (#1-4 below). The species:

1. Is nonindigenous to Massachusetts.
2. Has the biologic potential for rapid and widespread dispersion and establishment in minimally managed habitats.
3. Has the biologic potential for dispersing over spatial gaps away from site of introduction.
4. Has the biologic potential for existing in high numbers away from intensively managed artificial habitats.

If a species does not meet all four of the previous criteria, stop here. The species cannot be listed at this time. If a species meets all four, go on to criterion #5. The species:

5. Is naturalized in Massachusetts (persists without cultivation in Massachusetts).

If a species meets criteria #1-4 and criterion #5, it may be considered "INVASIVE " or "LIKELY INVASIVE" in Massachusetts. Go to criteria #6-9.

If a species does <u>not</u> meet criterion #5, but meets criteria #13-15, it may be considered "POTENTIALLY INVASIVE".

6. Is widespread in Massachusetts, or at least common in a region or habitat type(s) in the state.
7. Has many occurrences of numerous individuals in Massachusetts that have high numbers of individuals forming dense stands in minimally managed habitats.
8. Is able to out-compete other species in the same natural plant community.
9. Has the potential for rapid growth, high seed or propagule production and dissemination, and establishment in natural plant communities.

If a species meets the initial five criteria and criteria #6-9 it may be considered an "INVASIVE" species in Massachusetts.

If a species meets the initial five criteria, but does not meet all of criteria #6-9 at this time, it may be considered a "LIKELY INVASIVE" species in Massachusetts, if it meets at least one of the following three criteria (#10-12):

10. Have at least one occurrence in Massachusetts that has high numbers of individuals forming dense stands in minimally managed habitats.
11. Have the potential, based on its biology and its colonization history in the Northeast or elsewhere, to become invasive in Massachusetts.
12. Be acknowledged to be invasive in nearby states but its status in Massachusetts is unknown or unclear. This may result from lack of field experience with the species or from difficulty in species determination or taxonomy.

If a species meets the basic criteria for invasiveness (criteria #1-4) but is not naturalized in Massachusetts (criterion #5), the species may be considered "POTENTIALLY INVASIVE" in Massachusetts if it meets the following three criteria (#13-15):

13. The species, if it becomes naturalized in Massachusetts, based on its biology and biological potential, would pose an imminent threat to the biodiversity of Massachusetts **and**
14. Its naturalization in Massachusetts is anticipated **and**
15. The species has a documented history of invasiveness in other areas of the Northeast.

How are invasive plants introduced?

Multiflora Rose by Bill Byrne, *MassWildlife*

In some cases, invasive plants arrive in Massachusetts by accident, spreading from other areas where they have been established. Other invasive plants have been selected for their horticultural or agricultural attributes and have been widely planted, eventually escaping into the wild. Generally, invasive plants reproduce readily by seed and/or vegetative growth (shoots, tubers, or rhizomes). Wind, water and wildlife often disperse seeds, roots, and other plant parts of invasives, allowing them to easily colonize new locations, jumping across spatial gaps. Birds, for instance, consume the fruits of many invasive species and disperse their seeds widely, while other animals can transport seeds in their fur and on their feet. People also transport seeds and other parts of invasive plants on shoes, clothing, cars, and equipment. Contaminated fill dirt and mulch may expose natural areas to non-native plant invasions. Aquatic invasive species are commonly spread when plant parts attach to boat anchors and propellers and are transported from one contaminated body of water to another.

Why are invasive plants a problem?

Invasive plants impact the Massachusetts environment by competing with native plants for limited natural resources, dominating habitats and reducing food and shelter for native wildlife. Invasives can also eliminate the host plants of beneficial native insects and compete with native plants for pollinators. This competition at times causes biologically diverse forests, wetlands and meadows to become dominated largely by one or a few non-native invaders, diminishing ecological, economic, and aesthetic values of natural landscapes in Massachusetts.

Billions of dollars are spent annually in the United States to control invasive plants. Some aquatic invasives develop such large populations that they make lakes and waterways nearly inaccessible for swimming, fishing, and boating. In one year alone, Massachusetts spent over half a million dollars to control invasive aquatic plants. This figure does not account for the extensive containment efforts undertaken by municipalities and private landowners, lost revenue due to decreased recreational boating, swimming and fishing activities, or documented decreases in property values as a result of invasive infestations in neighboring water bodies.

How can the spread of invasive plants be prevented?

Non-native plant invasions can spread through natural areas at remarkable rates and, once established, eradication can become very difficult. The most opportune time to reduce their threat is before they become widely established, optimally before new invasions occur. Many aggressive non-natives have become so well established across our landscape that their eradication is highly impractical unless a new invasion is detected early.

The best method for control is prevention. Preventing intentional spread through horticulture, and removing or killing invasive plants

Dame's Rocket by Paul Somers, NHESP

when they are first spotted, can avoid significant problems later on. Be aware of the hazards invasive species pose and use this guide and other resources as aids in recognizing them. Please be careful to correctly identify invasive plants and not accidentally destroy beneficial native species!

If you are a landowner or land manager, always be alert for the appearance of invasive species on your property. Learn how to control or eradicate them and attempt to do so before they become serious problems. If you notice small populations of invasive plants on public land or in nature reserves, notify their managers. If caught in time, the cost and arduous labor of removing these species may be avoided or minimized.

Many of these non-native invaders are still planted in gardens or used for other horticultural uses. When gardening and landscaping, native and non-invasive, non-native alternatives to the harmful species featured in this booklet should always be sought at local nurseries. Be sure that your town does not use, recommend or approve the use of any plants featured in this booklet in landscaping or habitat restoration projects.

How are invasive plants controlled?

Some invasive plant populations are best controlled by hand-pulling, mowing, or cutting. Attacking a problem species by hand or with the aid of a few garden tools is often the least destructive option for natural habitats, but it is not always feasible for large occurrences. Moreover, some invasive plants can sprout prolifically when they are cut and may require multiple cuttings for several years before their roots finally die.

Certain invasive species are best treated with herbicides. This control method should be used with caution and discretion, and only if other alternatives prove unsuccessful. When applying over-the-counter herbicides, carefully read and follow marked instructions. Consider seeking professional advice from licensed applicators or consult the state Pesticide Bureau in the Massachusetts Department of Agricultural Resources, online at ***www.mass.gov/agr/pesticides***. It is important to be aware that in Massachusetts any invasive plant control in wetlands is regulated, and that herbicide application may require the applicator

to be certified. Please check with your conservation commission before doing any work within wetlands or the 100 foot wetland buffer.

Releasing well-researched and tested biocontrol organisms has been successful in managing certain species such as Purple Loosestrife (*Lythrum salicaria*). Research is ongoing for many other biocontrol organisms. The size of the invasive plant population and the type of habitat occupied will determine which control method is most appropriate.

What else can you do?

Besides working to educate others and control invasive plants on your own property or in your own town, you can assist conservation agencies and organizations with invasive species projects. For instance, you can consult the Invasive Plant Atlas of New England (IPANE) which is dedicated to detecting and monitoring the spread of invasive plant species in this region, available online at ***http://invasives.eeb.uconn.edu/ipane***. Other helpful resources include the Massachusetts Division of Fisheries and Wildlife at ***www.mass.gov/masswildlife*** or its Natural Heritage & Endangered Species Program (NHESP) at ***www.nhesp.org***, the New England Wild Flower Society (NEWFS) at ***www.newenglandwild.org***, The Nature Conservancy (TNC) at ***www.tnc.org***, the Massachusetts Nursery and Landscape Association (MNLA) at ***www.mnla.com***, your local garden club and other environmental or agricultural organizations. Confer with these agencies, groups and organizations for more information on what to plant, so as to avoid propagating harmful invasives. Volunteer to help with their invasive species projects.

About the Massachusetts Invasive Plant Advisory Group (MIPAG)

MIPAG is a voluntary collaboration between both public and private organizations. Its members represent federal and state agencies, land trusts and other conservation organizations, nursery and landscape associations, land managers, and scientific and academic institutions. It serves the Commonwealth in an advisory capacity, evaluating species for invasiveness using agreed upon scientific criteria and developing strategic recommendations for managing invasive plants in Massachusetts. MIPAG's Strategic Recommendations to the Executive Office of Environmental Affairs (EOEA), which include the current annotated list of 66 invasive species, can be found at ***www.massnrc.org/MIPAG***.

State Regulation

In 2005 the Massachusetts Department of Agricultural Resources established new rules to ban or phase-out the importation, propagation and sale in the Commonwealth of more than 140 plants identified as either noxious and/or invasive in the Commonwealth. This list was developed from both the Federal Noxious Weed List and the list developed by MIPAG and profiled in this booklet. This booklet lists regulation status for those plants listed as of January 1, 2006, but be aware that the list is subject to change. Please check the DAR website ***www.mass.gov/agr*** for the most recent list.

Water-chestnut fruit by Bill Byrne, *MassWildlife*

How to use this guide

This guide is intended to assist in the identification of the 66 invasive plant species currently regulated by the Commonwealth of Massachusetts. Your first step should be to determine whether the plant you have is a tree, shrub, vine, herb, grass, or aquatic plant. Turn to the appropriate section and use the photos, drawings and text descriptions to assist

Mile-a-minute and Asiatic Bittersweet by Pamela Polloni

you in your identification. If you already know the species name you are seeking, you can find it alphabetically by scientific name within each plant grouping. Key identification characteristics are **bolded** in the text.

We have tried to keep technical terms to a minimum, but in some cases there was no alternative for providing the clearest and briefest explanation of a plant character. We have therefore included a glossary with definitions of all the technical or botanical terms used in the text. Please be aware that you may need to confirm your identification by consulting additional references or an expert, particularly for difficult groups such as grasses and aquatic plants. A list of some useful references is provided at the back of the guide.

Noting that the management of invasive species can be challenging — and that best management practices (BMPs) may change — we chose not to include management information in the guide. However, excellent details on management options can be found at a number of web sites such as ***tncweeds.ucdavis.edu*** or ***www.invasivespecies.net***. For additional help see the table of recommended web sites at the back of this guide or do a web search on the desired species name. Likewise, we have deliberately not offered landscaping alternatives to the listed species. Many options exist and we do not want to limit what you consider. Again, we recommend that you use the websites listed in the back of the guide for more information, talk to experts, or do searches on line for additional management and landscaping information and recommendations.

L: Parrot-feather, *R*: Parrot-feather and Purple Loosestrife by Sallie Lou Johnson

Massachusetts Invasive Plant Species

Horned Poppy by Paul Somers, NHESP

TREE
STATUS: INVASIVE

Norway Maple

Acer platanoides L.

Bill Byrne, *MassWildlife*

Family: Maple (Aceraceae)

Regulated: Importation (July 1, 2006) and propagation/sale (January 1, 2009) prohibited

Identification: A tree that is generally 12-18 m (40-60′) tall but sometimes up to 30 m (100′). The trunk has grayish bark with regular shallow grooves. **Leaves are oppositely arranged** and 10-18 cm wide, each with a cordate base and 5-7 sharply tapering lobes. **Broken petioles display a milky sap.** Leaves are dark green but turn yellow in late autumn. "Crimson" cultivars produce dark red foliage. Flowers are produced in rounded, upright yellow-green umbels from April to May. Fruits are a **widely divergent pair of samaras arranged at nearly 180° angles from one another.**

Habitat: Introduced as an ornamental tree, Norway Maple is currently the most planted street tree in the United States. It naturalizes to urban woodlots, forest edges, and fragmented forests, and then invades less disturbed habitats such as early and late successional forests and floodplains. It is especially common in woodlands with mesic, moist, alluvial or colluvial soils.

Threat: Its shade-tolerance and efficient use of light, nutrients, and water allows it to outcompete native Sugar Maple and American Beech and form dense stands. Such canopies create shade that may displace or prevent regeneration of native trees, shrubs and herbs.

Distribution: It occurs in all regions of Massachusetts and in every state of New England. **Origin:** Europe and Western Asia.

Similar Species: Norway and Sugar Maple leaves are quite similar having "U" shaped sinuses separating the leaf lobes, but the milky sap of Norway will help distinguish the two species. Silver Maple (*Acer saccharinum*) and Red Maple (*Acer rubrum*) leaves have whitened or silvery undersides, "V" shaped sinuses separating the leaf lobes, and clear sap. The non-native Sycamore Maple (*Acer pseudoplatanus*) has "V" shaped leaf sinuses and flowers in long drooping racemes instead of round-topped, upright inflorescences. The large, widely divergent samaras also separate Norway from these other maples.

Paul Wray, Iowa State University, www.forestryimages.org

TREE
STATUS: INVASIVE

Sycamore Maple; Planetree Maple

Acer pseudoplatanus L.

Photos by Leslie Mehrhoff, IPANE

Family: Maple (Aceraceae)

Regulated: Importation (July 1, 2006) and propagation/sale (January 1, 2009) prohibited

Identification: A tall tree that can reach 30 m (100′) in height. The tree's bark has irregular flakey patches. **Leaves are dark green and coarsely-toothed** with somewhat whitened undersides and light green major veins. Each leaf is 7-15 cm (3-6″) wide with 5 lobes and is **thick with a leathery texture, unlike most maples.** Sycamore Maple flowers in May, producing small, **slender yellow-green flowers arranged in hanging racemes**, 5-15 cm (2-6″) in length. Broad **samaras** are 2.5-3.8 cm long and arranged at 60-90° angles from one another.

Habitat: Sycamore Maple grows in full sun to partial shade and is most suited to exposed, coastal habitats. It can tolerate salt-spray and soil extremes and survive in polluted areas. The tree often invades open disturbed areas, pastures, and roadsides.

Threat: Sycamore Maple escapes from cultivation and can form dense stands that outcompete native tree species. Its seeds are dispersed by wind, water and vehicles.

Distribution: This tree occurs mainly in the southeastern counties of Massachusetts. In New England it is most commonly found in coastal areas of Cape Cod, Rhode Island and southeastern Connecticut. **Origin:** Europe and Western Asia.

Similar Species: This invasive resembles native maples and the non-native Norway Maple. Differentiate Sugar Maple (*Acer saccharum*) and Norway Maple (*Acer platanoides*) by their "U" shaped gaps between the leaf lobes, lack of fine teeth on the margins, and by the milky juice in broken petioles and veins of the latter. Red Maple (*Acer rubrum*) and Silver Maple (*Acer saccharinum*) have sharp "V" shaped leaf gaps like Sycamore Maple. Red Maple can be distinguished by its reddish twigs and buds, smaller leaves and small tight clusters of red flowers that precede leaf out, while Silver Maple is easily identified by the silvery-white undersides of its leaves.

TREE
STATUS: INVASIVE

Tree-of-heaven, Copal Tree, Chinese Sumac

Ailanthus altissima
(P. Miller) Swingle

Photos by Rachel Kramer

Family: Quassia (Simaroubaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A rapidly growing deciduous tree up to 24 m (80′) tall. Stems are smooth with pale gray bark. **Compound leaves are 0.3-0.9 m (1-3′) long and have 11-25 lance-shaped leaflets** that are 7-13 cm (3-5″) long and oppositely arranged along the leaf axis. **Leaflet bases often have 1 or 2 coarse, glandular teeth**. Small, yellow-green flowers appear in terminal panicles in late spring. Female trees produce seeds at the center of **flat, slightly twisted, papery, 3-5 cm long samaras** in the summer. Samaras start yellow-green to orange-red and change to brown as they persist into the winter. The trees, especially their **flowers and glandular leaflets, have a strong, unpleasant odor** likened to burnt peanut butter.

Habitat: Tree-of-heaven is most often seen in disturbed urban areas and in fields, forest gaps and along woodland edges. It is intolerant of dense shade, but survives well in poor soils and can grow in habitats with high air pollution levels. Considered an agricultural pest, its seedlings may sprout by the hundreds in recently planted fields.

Threat: A prolific seed producer, a single tree can produce up to 325,000 seeds per year, dispersed by wind and water. This fast growing tree displaces native vegetation by forming impenetrable thickets and producing toxins or growth inhibitors in the soil. Aggressive root systems and suckers may cause costly damage to sewers and foundations.

Distribution: This plant occurs in all regions of Massachusetts and is present in all northeastern states.

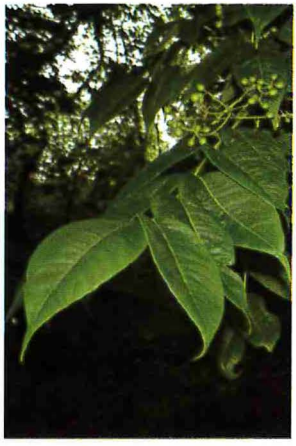
Origin: China.

Similar Species: Native sumacs (*Rhus spp.*) and walnuts (*Juglans spp.*) have alternate compound leaves but lack the small glandular teeth of *Ailanthus*. Black Walnut (*Juglans nigra*) and Butternut (*Juglans cinerea*) produce hard-coated green nuts. Distinguish Staghorn Sumac (*Rhus typhina* or *R. hirta*) by its fuzzy, reddish-brown branches, toothed leaflet margins, and erect, fuzzy red fruits.

TREE
STATUS: LIKELY INVASIVE

Amur Cork-tree

Phellodendron amurense Rupr. (sensu lato) (Synonyms: *P. japonicum*, *P. amurense* var. japonicum, *P. sachalinense*, *P. amurense* var. sachalinense, *P. lavallei*, *P. amurense* var. lavallei)



Photos by Lou Wagner

Family: Rue (Rutaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A deciduous tree up to about 12 m (40′) tall. Mature trees have stout trunks with thick **cork-like, deeply ridged bark** and branches that are shelf-like and spread into a wide crown. **Compound leaves measure up to 38 cm (15″) long**, are **pinnate and bear an odd number of leaflets, generally between 5 and 13**. Leaves are dark green but turn bright yellow in the fall; they have a citrusy smell when crushed. Trees are male (nonfruiting) or female (fruiting). Drooping clusters of greenish-yellow, inconspicuous flowers appear in June. Clusters of fleshy 7-13 mm berry-like fruits (technically drupes) appear in summer, turning from green to black as they ripen. Fruits often persist on the branches through the late fall and early winter.

Habitat: Amur Cork-tree can grow in full sun to full shade in a range of environmental conditions and is generally found in upland habitats. It can grow in soils ranging from sand to clay and can withstand periods of drought. Amur Cork-tree is not seriously attacked by any native pest species and produces large quantities of fruit in moist, nutrient-rich soils.

Threat: Seeds, often produced in high volume, are bird dispersed, allowing establishment of populations in disturbed habitats and natural areas well removed from the source. The species has been observed invading urban and suburban woodlots, and edges of forests, and can form a dense understory in mature oak forests, suppressing oak regeneration.

Distribution: In New England, Amur Cork-tree occurs in eastern and central Massachusetts and Connecticut. **Origin:** Eastern Asia.

Similar Species: It can be confused with other nonnative cork trees (*Phellodendron* spp.) but probably would not be mistaken for any native eastern tree species.

TREE
STATUS: INVASIVE

Black Locust; False Acacia

Robinia pseudoacacia L.

Leslie Mehrhoff, IPANE

Family: Pea or bean (Fabaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A rapidly growing **deciduous tree** that can reach 30 m (100′) tall. Trunks have **deeply furrowed gray to dark brown bark** and may grow to 1 m (3.5′) in diameter. **Branches and twigs usually have sharp, paired spines** up to 15 mm long at leaf bases. **Compound leaves** are 20-36 cm (8-14″) long and each bears 7-19 **blue-green paired and rounded** leaflets. Leaflets are 2.5-5 cm (1-2″) in length and turn yellow and drop early in the fall. **Fragrant, white pea-like flowers** with yellow centers appear in May-June **in dense racemes** 18-25 mm long. It **fruits** from September-October, producing 5-10 cm (2-4″) **long, flat, brown, pods** with 4-8 reddish-brown seeds.

Habitat: Black Locust grows in full sun to partial shade, but is intolerant of dense shade and poorly drained soils. In the eastern United States, it occurs in immature forests, woodlands, roadsides, grasslands, and agricultural landscapes. It prefers sandy soils and can tolerate high soil acidity.

Threat: Planted outside its traditional range for its durable hard wood (often used for fence posts), Black Locust has escaped from cultivation in the Northeast and elsewhere. It can grow up to 0.6 m (2′) per year. It spreads vegetatively by root suckering and stump sprouting, forming dense stands. A great nectar producer, it can outcompete native plant species for pollinators. The leaves, seeds and bark are toxic to humans and livestock.

Paul Somers, NHESP

Distribution: This tree occurs throughout Massachusetts and in every state of New England. **Origin:** The southeastern United States north to central Pennsylvania.

Similar Species: Other *Robinia* locusts are shrub-sized and have bristly, glandular, or hairy twigs. Honey Locust (*Gleditsia triacanthos*) may be differentiated by the numerous long thorns it has along its trunk. Northern Prickly-ash (*Zanthoxylum americanum*) is a smaller tree with toothed leaflets and prickly petioles.

SHRUB
STATUS: INVASIVE

Japanese Barberry

Berberis thunbergii DC.

Rachel Kramer

Family: Barberry (Berberidaceae)

Regulated: Importation (July 1, 2006) and propagation/sale (January 1, 2009) prohibited

Identification: A **dense, deciduous shrub** that grows 0.6-1.8 m (2-6′) tall. Stems and branches are brown to red and deeply grooved with **single, usually unbranched spines at each node**. **Alternate leaves are 1.2-3.8 cm (0.5-1.5″) long and spatulate or obovate in shape. Leaf color ranges from blue-green to green to dark reddish purple**. Plants bloom in mid April-May, producing 8 mm long **yellow flowers that hang in clusters of 1-4 from the leaf axils along the length of the stem. Bright red, elliptical berries** are borne on narrow stalks between July and October. These fruits often persist through the following spring.

Habitat: Japanese Barberry prefers full sun to partial shade, but succeeds in reproducing in heavily shaded habitats. It is drought tolerant, but most successful in mesic to moist soils where it may form dense, continuous stands. Typical habitats include open fields, pastures, wastelands, thickets, wetland edges, swamps, closed-canopy forests and woodlands.

Threat: By developing dense populations in natural areas, Japanese Barberry displaces native plant species and reduces habitat and forage for some local wildlife. White-tailed deer may avoid browsing on Japanese Barberry while feeding on other species, thus providing a competitive advantage for the barberry. The plant also alters soil acidity and nitrogen levels, reducing the biological activity of native soils. It spreads by vegetative expansion as well as by seed, with an estimated 90% germination rate. Birds such as turkey and ruffed grouse also readily disperse its seed.

Distribution: Japanese Barberry occurs throughout Massachusetts and is present in all the states of New England. **Origin:** Japan.

Bill Byrne, *MassWildlife*

Similar Species: American Barberry (*Berberis canadensis*) is the only native species of barberry in North America, and its range does not include the New England states. Common Barberry (*Berberis vulgaris*) is a listed "Likely Invasive" shrub and has bristly-toothed leaves and flowers that droop in many-flowered racemes.

SHRUB
STATUS: LIKELY INVASIVE

Common Barberry; European Barberry

Berberis vulgaris L.

Stacey Leicht, IPANE

Family: Barberry (Berberidaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: An upright, branching shrub that may grow 3 m (10′) tall. Branches have simple or often 3-parted spines and are gray or yellow-gray. **Leaves are obovate, oblong, dull green to purple with fine or bristle-toothed margins**. Leaves may reach 5 cm (2″) in length and are arranged either alternately along the stem, or in small clusters. **Bright yellow flowers appear** May-June. Flowers have an unpleasant odor and occur **in suspended racemes of 10-20 blooms**. The plant produces juicy elliptical red fruits that each contain 1-3 small, black seeds.

Habitat: Common Barberry grows in full sun to full shade, doing especially well in calcareous soils. This invasive is most commonly found in upland areas such as rock outcrops or thin canopy forests as well as along roadsides and in abandoned lots and fields.

Threat: Once a common plant, this non-native has been widely eradicated because it serves as an alternate host for wheat rust, which can devastate grain crops in agricultural areas. Common Barberry remains a concern, with the potential to spread once again and become a serious pest. Common Barberry is able to hybridize with invasive Japanese Barberry (*Berberis thunbergii*), producing *Berberis* x *ottawensis*, which can also behave invasively.

Distribution: It occurs in all regions of Massachusetts and can be found scattered across New England. **Origin:** Europe.

Similar Species: Common Barberry resembles invasive Japanese Barberry. Distinguish Japanese Barberry by its smooth leaf margins, few flowers per cluster, and dry berries (as opposed to juicy) occurring singly or in small umbels.

Britton, N.L., and A. Brown. 1913. *Illustrated Flora of the Northern States and Canada.* **Vol. 2: 127.**

SHRUB
STATUS: INVASIVE

Autumn Olive

Elaeagnus umbellata
Thunb.

Leslie Mehrhoff, IPANE

Family: Oleaster (Elaeagnaceae)

Regulated: Importation and propagation/sale prohibited (Jan. 1, 2006)

Identification: A deciduous shrub that grows 3.7 m (12′) or more in height. Branches often bear thorns. Alternate leaves are 2.5-8 cm (1-3″) long and egg or lance-shaped. The **leaves are dark green** above with smooth margins. **Leaf undersides**, as well as stems and buds, **are densely covered in silvery-white to rusty-colored scales**. Flowering occurs between April and May with small, **light-yellow or creamy colored fragrant flowers** appearing along the stem in clusters. **Small, round, juicy fruits are red to pink and dotted with silvery surface scales**.

Habitat: Autumn Olive is a drought tolerant shrub that grows in full sun. The plant's ability to fix nitrogen in its roots allows it to grow in poor soils. It does not do well in wet environments or dense forest habitats. Historically planted along roadsides and in abandoned fields as an ornamental and wildlife food plant, it thrives in a variety of soil and moisture conditions and invades open woodlands, fields, grasslands, and disturbed habitats.

Threat: Its ability to fix nitrogen provides a competitive advantage over native plants in habitats with nutrient-poor soils. Shade created by Autumn Olive inhibits the growth of other species. When cut, this plant resprouts abundantly. The plant is a prolific fruit producer and single shrubs have been observed to bear up to 80 lbs. of fruit per growing season. The berries are dispersed by birds and other animals.

Distribution: Reported in all regions of Massachusetts and from naturalized occurrences in Connecticut and Rhode Island. **Origin:** Korea, China and Japan.

Bill Byrne, *MassWildlife*

Similar Species: Russian Olive (*Elaeagnus angustifolia*) is a similar non-native shrub species reported in the states of New England and vegetatively can be difficult to distinguish from Autumn Olive. Its leaves have dense silvery scales on both surfaces. It produces yellow flowers and dry, yellowish berries with silver scales.

SHRUB
STATUS: INVASIVE

Winged Euonymus; Burning Bush; Winged Burning Bush; Winged Spindle-tree

Euonymus alatus
(Thunb.) Sieb.

Rachel Kramer

Family: Staff-tree (Celastraceae)

Regulated: Importation (2006) and propagation/sale prohibited (January 1, 2009)

Identification: A deciduous shrub that is 1.5-3.0 m (5-10′) tall and similarly wide. Mature plants may grow up to 6 m (20′) in height. There are also smaller cultivars. **This many-stemmed, oppositely branching shrub** generally has **2-4 wide, corky wings along its gray-brown to green branches. Leaves are elliptic**, 2.5-7.6 cm (1-3″) long, nearly stalkless, dark green, with finely serrated margins, **and arranged oppositely along the stem**. They change to **brilliant shades of red and purple in the autumn**. Small, four-parted, greenish or yellowish-green flowers appear late April-June. In late summer red-purple capsules split open to reveal 4 orange or orange-red arils (fleshy growths surrounding the seeds).

Habitat: Winged Euonymus grows in full sun to full shade. Its shade tolerance allows this plant to invade forest understories. It is also a plant of disturbed areas such as abandoned fields, thickets, and roadsides. It can tolerate a variety of soil types and acidity levels, but does best in well-drained soils.

Threat: This shrub forms dense thickets that crowd and shade out many plant species. A variety of habitats are threatened by Winged Euonymus, including upland forests, river edges and floodplains, and coastal shrublands. Birds feed on the juicy fruits of this species, widely dispersing its seed and allowing it to escape cultivation and invade natural areas.

Distribution: Winged Euonymus occurs in all regions of Massachusetts and is found throughout New England. **Origin:** Northeastern Asia to central China.

James H. Miller, USDA, Forest Service, www.forestryimages.org

Similar Species: Other species of *Euonymus* have been introduced into Massachusetts, but none has the winged branches and twigs of Winged Euonymus. Highbush Blueberry (*Vaccinium corymbosum*) is a deciduous shrub of similar size, with foliage that reddens in the fall. Distinguish this plant by its alternate leaves, small urn-shaped white flowers, and blue-black berries.

SHRUB
STATUS: INVASIVE

Glossy Buckthorn; European Buckthorn; Alder Buckthorn

Frangula alnus P. Mill.
(Synonyms: *Rhamnus frangula, R. frangula* var. *angustifolia*)

Chris Mattrick, NEWFS

Family: Buckthorn (Rhamnaceae)

Regulated: Importation and propagation/sale prohibited (Jan. 1, 2006)

Identification: A deciduous upright shrub or small tree that may reach 6.1 m (20′) in height. **The shrub's gray-brown bark is smooth with visibly speckled lenticels**. The **wine-red roots** help to identify even the seedlings. **Leaves** are 2.5-6.3 cm (1-2.5″) long, **alternately arranged, and vary in shape from obovate to oblong to elliptical. They are dark green (yellow in fall) and shiny with nearly parallel veins, and entire margins**. Yellowish-green flowers appear May-September in umbels each containing 1-8 flowers. **Small round juicy fruits with 2-3 stones change from red to black as they ripen** from July-October.

Habitat: Glossy Buckthorn grows in full sun to full shade and is highly moisture tolerant, growing in a range of soil types. The plant tolerates but is less vigorous in densely shaded environments. It has been observed in fens, swamps and along bog edges, as well as in upland habitats such as woodlands, thickets, old fields and fencerows.

Threat: It is capable of forming dense shrub layers, especially in moist forest understories or upland openings and edges, thus interfering with natural processes of succession and regeneration of native species. Because it fruits throughout the growing season, its seed is dispersed over prolonged periods by birds and other wildlife.

Rachel Kramer

Distribution: Glossy Buckthorn occurs in all regions of Massachusetts and is present in all the states of New England. **Origin:** Eurasia and North Africa.

Similar Species: Common Buckthorn (*Rhamnus cathartica*), another invasive plant species, has oppositely to subopposite arranged leaves, arching leaf veins, and minutely serrated leaf margins. *Rhamnus alnifolia* is a short, native buckthorn found mainly in the calcareous fens of western Massachusetts; it has ovate, finely toothed leaves.

SHRUB
STATUS: LIKELY INVASIVE

Border Privet

Ligustrum obtusifolium
Sieb. & Zucc.

Photos by Leslie Mehrhoff, IPANE

Family: Olive (Oleaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A shrub with many stems up to 3 m (10′) tall and many opposite branches. **Twigs are pubescent. Leaves are oppositely arranged** with dark green surfaces **and pubescent undersides** or lower mid-ribs, the hairs measuring over 0.2 mm long. Leaves are usually oblong, 2.5- 5 cm (1-2″) long and up to 2.5 cm (1″) wide, and have wedge shaped bases and acute to obtuse apexes. They turn russet to purplish in the fall. Nodding panicles of **white flowers with pubescent sepals** and pedicels appear in June, emitting a displeasing odor. **Flowers are required for accurate identification.** The **sepals are pubescent** and the **corolla tube** (5-8 mm long) is **about twice as long as the corolla lobes** or longer. The **anthers, measuring 3 mm long, reach nearly to the tip of the corolla lobes**. Spherical, green, and slightly glaucous fruits measure about 6 mm across; they are borne in late summer; blacken as they ripen and remain into the winter.

Habitat: Border Privet is commonly observed in woodlands and forest edges, as well as in old fields, thickets, and along roadsides. It grows in full sun to full shade.

Threat: The seeds of this species are easily bird dispersed into many habitat types. Border Privet's shade tolerance may give it a competitive advantage over native plant species. More data are needed on this plant's density and distribution in Massachusetts.

Distribution: It occurs in all regions of Massachusetts and in every New England state except Maine. **Origin:** Japan.

Similar Species: Border Privet closely resembles other non-native privets, cultivars and hybrids that have become naturalized in New England. Common Privet (*Ligustrum vulgare*) and Chinese Privet (*L. sinense*) have short corolla tubes (2.5-3 mm) and smaller anthers (2 mm long). California Privet (*L. ovalifolium*) has glabrous twigs and pedicels, leaves that persist into the winter, and anthers extending beyond the corolla lobes.

SHRUBS

Bush Honeysuckles: Several species of invasive bush honeysuckles have become widely naturalized in New England. Flowers are required for positive identification of most species, but these species can form hybrids, and then back cross with the parents to form hybrid swarms, making precise identification difficult. Because of their similarities in appearance and behavior, they are presented here as a group.

STATUS: POTENTIALLY INVASIVE

Amur Honeysuckle

Lonicera maackii (Rupr.) Herder

John Randall, TNC

Right: Chuck Bargeron, in Bargeron, C.T. et al. 2003. Invasive Plants of the Eastern U.S. Univ. of Georgia, USDA APHIS PPQ, and USDA Forest Service, Forest Health Tech. Enterprise Team. FHTET-200-08 (CD-ROM)

STATUS: INVASIVE

Morrow's Honeysuckle

Lonicera morrowii A.Gray

Leslie Mehrhoff, IPANE

Rachel Kramer

STATUS: LIKELY INVASIVE

Tartarian Honeysuckle

Lonicera tatarica L.

Leslie Mehrhoff, IPANE

STATUS: INVASIVE

Bell's Honeysuckle

Lonicera x bella Zabel

Photos by Leslie Mehrhoff, IPANE

Family: Honeysuckle (Caprifoliaceae)

Regulated: Importation (July 1, 2006) and propagation/sale (January 1, 2009) prohibited

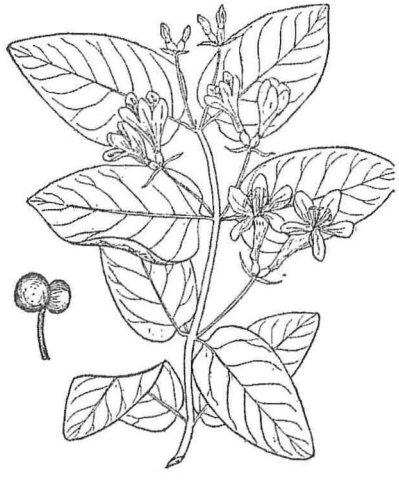
Identification: Erect perennial shrubs that may grow up to 5 m (17') tall. All introduced shrubby honeysuckles have **hollow stems and twigs**. **Opposite** leaves are long, lanceolate to ovate in shape. The Amur Honeysuckle has acuminate leaves (taper to a small pointed tip), white or pale pink flowers (yellowing with age) on peduncles that are shorter than the leaf *petioles*. The Tatarian Honeysuckle has leaves that are glabrous

beneath, smooth or nearly smooth young twigs, a corolla (usually pink to red) that is smooth externally on peduncles that are longer than the petioles. The leaf base is truncate across the bottom. Both *L. morrowii*, and *L. x bella* have peduncles that are longer that the petioles, but the leaves are pubescent beneath and the corollas are pubescent (sometimes only slightly) externally. The flowers of *L. morrowii* are generally white (yellowing with age) while *L. x bella* flowers are usually pink and are sparingly pubescent. (*L. x bella* is a hybrid of *L. morrowii* x *L. tatarica*). At flowering, the bracteoles surrounding the ovary are more than half as long as the ovary in *L. morrowii* while the bracteoles in *L x bella* are less than half as long as the ovary. All bush honeysuckles flower in late May-June and this is followed by **round red fruits in pairs** that ripen mid-to late summer along the stem.

Habitat: Bush Honeysuckles can grow in full sun to fairly shaded habitats in a wide range of soil conditions. Common habitats are woods, woodland edges, floodplains, floodplain forests, swamps, fencerows, roadsides, open fields, agricultural lands, and lawns.

Threat: These non-natives escape from cultivation and may form large stands that out-compete native plants. Birds consume the fruits, resulting in seed dispersal to many habitat types.

Distribution: For *L. maackii*, specimens have been reported from a number of counties in Massachusetts, but better data on the extent of naturalization at these locations are still required. In New England it is currently limited to Connecticut and Massachusetts. *L. tatarica* has been found across Massachusetts and is present in all the states of New England. *L. morrowii* and *L. x bella* occur in all regions of Massachusetts and throughout New England. **Origin:** *L. maackii*–Japan, China and Korea; *L. tatarica*–Russia and Central Asia; *L. morrowii*–Japan, and *L. x bella*–Europe.



Similar Species: Native species of Bush Honeysuckles can be easily distinguished from non-native species by their solid stems. The non-natives all have hollow stems. *Lonicera canadensis* is a native shrubby honeysuckle (found primarily in western Massachusetts) which also has red berries and leaves that taper toward the apex like *L. maackii*. Its flowers are not strongly two-lipped at their base and lack the hairy *styles* found in the non-native honeysuckles.

Tartarian Honeysuckle: Britton, N.L., and A. Brown. 1913. *Illustrated Flora of the Northern States and Canada.* Vol. 3: 282

SHRUB
STATUS: INVASIVE

Common Buckthorn
Rhamnus cathartica L.

Paul Somers, NHESP

Family: Buckthorn (Rhamnaceae)

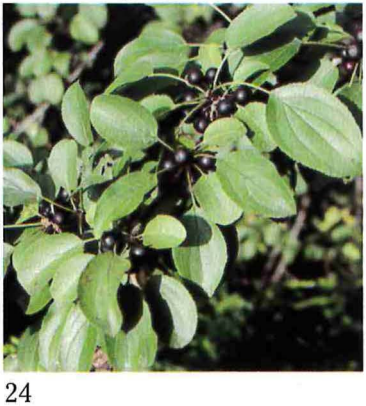
Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A deciduous shrub or small tree that may grow up to 6.7 m (22′) tall and develop a trunk up to 25 cm (10″) wide. External bark is gray to brown and inner bark is yellow. **Twigs are generally spine-tipped. Leaves are glossy green, up to 7.6 cm (3″) long, hairless, have slightly serrated margins, and possess 2-4 prominent lateral veins arising from the midrib near the leaf base and arching toward the tip. Most are arranged oppositely** or nearly so, but some are clearly alternate along the stem; they are retained well into the fall. In the spring, 4-petaled yellow-green flowers grow in clusters of 2-6 near the bases of the plant's petioles. **Fall fruits are round and black or dark purple, each containing up to 4 seeds.**

Habitat: Common Buckthorn grows in full sun to full shade in a variety of soil types, but prefers somewhat shaded conditions and does best in well-drained soils in both moist and dry upland sites, open woods, pastures, and along roadsides. It can form extensive monotypic stands in calcareous habitats.

Threat: It forms dense thickets that reduce sunlight availability for other vegetation and crowd-out native species. Dense seedlings prevent the regeneration of native trees and shrubs, interfering with natural fires in fire-adapted ecosystems. It acts as an alternate host for crown rust, which can reduce the oat yields of small grain farmers.

Distribution: Common Buckthorn occurs in all regions of Massachusetts and throughout New England. **Origin:** Eurasia.



Leslie Mehrhoff, IPANE

Similar Species: Alder-leaf Buckthorn (*Rhamnus alnifolia*) is a small native buckthorn occurring in shrub wetlands of western Massachusetts, but has finely toothed leaves with straight veins. Glossy Buckthorn (*Frangula alnus*), another invasive shrub, lacks spine-tipped twigs, has straight, parallel leaf veins, and shows red in its immature berries and on the roots and stem bases when pulled.

SHRUB
STATUS: INVASIVE

Multiflora Rose

Rosa multiflora Thunb.

Photos by Bill Byrne, *MassWildlife*

Family: Rose (Rosaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A deciduous **shrub with arching and scrambling stems** that may grow up to 3.0-4.6 m (10-15') tall. **The stems are red to green with scattered, broad-based prickles**. Leaves are pinnately compound, each comprised of 5 -11 elliptic leaflets with sharply serrated margins. **Stipules with comb-like fringed margins adhere to the petiole for more than half their length**. Leaflets are dark green and smooth above, and pale and usually pubescent below. **Large pyramidal clusters of fragrant, mostly white but sometimes pink, 5-petaled flowers** appear from May-June. Flowers have petals measuring 1-2 cm long and **glabrous styles united into a fused column**. Small, red, ovoid to elliptic rose hips containing achenes are borne in late summer. These hips become leathery as they age and remain on the plant throughout the winter.

Habitat: Multiflora Rose grows in full sun to full shade and tolerates a wide variety of soil and moisture conditions. The plant grows best in open, fertile, moist upland habitats. It commonly occurs along roadsides, streambanks and in pastures, but can also be found in successional and mature woods.

Threat: It forms dense thickets, rapidly outcompeting other plant species and at times dominating fallow or abandoned pasture land. The plant's fruits (achenes contained inside rose hips) are readily consumed by birds, leading to widespread dispersal. Each plant is capable of producing half a million achenes or more and these may remain viable in the soil for as many as 20 years.

Distribution: It occurs throughout Massachusetts and in all other states of New England. **Origin:** Japan, China and Korea.

Similar Species: There are many native and naturalized roses in Massachusetts, but the many flowers and exceptionally small hips of Multiflora Rose will usually identify it. Also, its styles are glabrous and united, instead of free as in most other roses. Most other roses have stipules that adhere to the base of the petioles, but not all are comb-like (fringed or toothed), as in Multiflora Rose.

SHRUB
STATUS: LIKELY INVASIVE

Wineberry; Japanese Wineberry; Wine Raspberry

Rubus phoenicolasius Maxim.

Leslie Mehrhoff, IPANE

Family: Rose (Rosaceae)

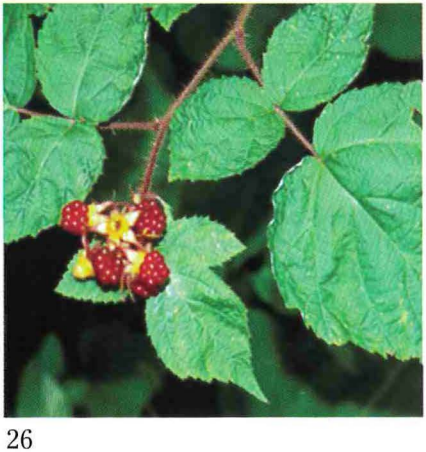
Regulated: Importation and propagation/sale prohibited (Jan. 1, 2006)

Identification: A deciduous shrub with a **perennial underground rhizome and upright arching biennial stems (canes)** that may reach 1.8 m (6′) in height, but **typically arch and root at the tips forming new plantlets. Stems, petioles and inflorescences are covered in dense reddish or purple, glandular hairs and occasional slender prickles.** Alternate leaves feature 3 leaflets with serrated margins, pubescent surfaces and hairy white undersides. Terminal leaflets are 10 cm (4″) in length, while lateral leaflets are considerably smaller. In May-June, **small, white-petaled flowers appear in branched clusters. Flower sepals are significantly longer than petals, allowing them a bud-like appearance, even when blooming**. Fruits ripen June-July into juicy, red, occasionally hairy fruits.

Habitat: Wineberry grows in full sun to partial shade. The plant does best in sunny environments with moist soils and may be observed in habitats ranging from open disturbed areas to herbaceous wetlands or early successional forests.

Threat: This species forms dense thickets that crowd and shade-out native plant species. Wineberry fruits are borne in vast quantities and are widely dispersed by animals, including humans.

Distribution: Wineberry is found in southern regions of the state and in portions of all the New England states except New Hampshire and Maine.



John Randall, The Nature Conservancy

Origin: Japan and China.

Similar Species: There are many native species of *Rubus*, few of which may be confused with Wineberry. The natives do not have the dense, reddish-purple, gland-tipped hairs on the stems, and most do not arch and root. Black Raspberry (*Rubus occidentalis*) is one native of about the same height that often roots at the tips, but it has sparse, broad-based prickles and black fruit when ripe.

VINE
STATUS: LIKELY INVASIVE

Porcelain-berry; Amur Peppervine

Ampelopsis brevipedunculata (Maxim.) Trautv.
Syn.: *Ampelopsis heterophylla* (Thunb.) Sieb. & Zucc. var. *brevipedunculata* C.L. Li

Photos by Leslie Mehrhoff, IPANE

Family: Grape (Vitaceae)

Regulated: Importation and propagation/sale prohibited (Jan. 1, 2006)

Identification: A **deciduous, woody vine up to 6 m (20') long. Old stems have tight bark, lenticels, and white pith. Twigs and petioles have coarse hairs. Alternate leaves are broadly ovate and sometimes with 3-5 shallow or deep lobes; these sometimes cleft again. The blades are coarsely toothed, hairy below, and sometimes variegated. Tendrils are few and lack adhesive disks at their tips. Inconspicuous yellow to greenish white flowers in forking cymes appear opposite the leaves** from July-August. The five petals are completely separate from one another on a cup-shaped nectary disk. Fruits are spherical, hard, and initially yellow, green or lilac but turn bright blue, white or a marbled mix of colors. The berries are typically ripe in September-October.

Habitat: Porcelain-berry grows in full sun to partial shade, but does best in moist soils with partial sun. It is found in disturbed areas such as along railroad beds or highway shoulders, but also along streambanks, shorelines, forest edges, and in fields and thickets.

Threat: A vigorous invader of open and wooded areas, it shades and smothers native vegetation. The plant grows rapidly and its seed has a high germination rate. Fruits are buoyant and easily dispersed by water. Birds also spread the seed, making it very difficult to control.

Distribution: Porcelain-berry is found in the southeastern counties of Massachusetts, but occurs in western counties as well. Elsewhere in New England, it occurs in Connecticut, New Hampshire, and Rhode Island. **Origin:** Asia.

Similar Species: Wild grapes (*Vitis* spp.) resemble Porcelain-berry, but their stems have bark that shreds or peels in long strands, brown pith and no obvious lenticels. Also, the petals of grapes are separate only at the base and are fused at the apex. Virginia Creeper (*Parthenocissus quinquefolius*) is a related white-pithed vine, but has palmately compound leaves with five distinct leaflets and tendrils terminated by adhesive disks.

VINE
STATUS: INVASIVE

Asiatic or Asian Bittersweet; Oriental Bittersweet

Celastrus orbiculatus Thunb.

Rachel Kramer

Family: Staff-tree (Celastraceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A **climbing deciduous, woody vine** up to 18 m (60′) long or **sometimes a low trailing shrub spreading by orange-colored roots. Stems are brown with warty lenticels when young, but gray-barked on older stems** that can reach up to 15 cm (6″) in diameter. New twig growth is smooth and green. **Leaves are alternately arranged, short petioled**, roundish to obovate, with bluntly serrated margins and abruptly pointed tips. Typical leaf dimensions are about 3-5 cm wide x 5-8 cm long. **Axillary clusters of 2-3 small, 5-parted, greenish flowers bloom from May through June. Globular, three-valved, yellow-orange capsules with three red fleshy arils inside are produced from July-October. At maturity they split open to reveal the arils, each with 1-2 seeds inside.**

Habitat: It invades forest edges, woodlands, hedgerows, early successional fields, coastal areas and salt marsh rims. It thrives in disturbed areas and can grow in full sun to partial shade. Generally found in open, sun-exposed sites, it can still persist in successional forest environments.

Threat: Asiatic bittersweet grows rapidly, shading and girdling native plants, causing significant damage to native woody plants by uprooting them entirely or breaking their branches under its weight. It can hybridize with native American Bittersweet (*Celastrus scandens*) or simply displace it. Asiatic Bittersweet is capable of reproducing vegetatively, through root suckers, and by seed. Seeds are most often dispersed by birds, but may also be spread by humans when dried wreaths and decorative autumn arrangements are discarded into the natural landscape.

Leslie Mehrhoff, IPANE

Distribution: It occurs in all regions of Massachusetts and in all New England states. **Origin:** Asia.

Similar Species: Native American Bittersweet (*Celastrus scandens*) can be differentiated by its inflorescences, which are terminal and many flowered. The leaves of the two bittersweets are similar, but those of the native *C. scandens* are narrower, ca. 2x as long as wide, and obovate leaves are absent.

VINE
STATUS: INVASIVE

Black Swallow-wort; Louise's Swallow-wort

Cynanchum louiseae
Kartesz and Gandhi
Synonyms: *Cynanchum nigrum* (L.) Pers. non Cav;
Vincetoxicum nigrum (L.) Moench.

Kitty Kohout, courtesy of the Wisconsin State Herbarium

Family: Milkweed (Asclepiadaceae)

Regulated: Importation and propagation/sale of both species prohibited (January 1, 2006)

Identification: An herbaceous perennial vine with unbranched stems 1-2 m (3-6′) long **that twine atop and among supporting vegetation. Stems spread rhizomatously and possess a milky latex. Leaves are opposite with short petioles. The leaf blades are shiny, ovate**, 5-10 cm (2-4″) long **with rounded or heart-shaped** bases and apexes that taper to a point. **Flowers in axillary clusters** of 6-10 appear from June-September. Corollas possess **five fleshy, purple-black triangular lobes (1.5-3 mm) with tiny white hairs above. Slender, smooth, elliptical pod-like fruits, resembling those of milkweeds**, are 4-7 cm long. They are green initially, but brown with age, opening along one side to reveal many flat seeds with tufts of silky white hair.

Habitat: Black Swallow-wort can grow in full sun to partial shade. It invades a variety of habitats including fields, woodlands, roadsides and floodplain edges.

Threat: Its rapid rate of growth allows it to out-compete native vegetation, often becoming a dominant species where it has invaded. Its seeds are wind-dispersed and it resprouts readily after cutting. The species is deadly to monarch butterflies that feed on it.

Distribution: Black Swallow-wort occurs in all regions of Massachusetts and in every state of New England. **Origin:** Europe.

Britton, N.L., and A. Brown. 1913. *Illustrated Flora of the Northern States and Canada.* **Vol. 3: 36.**

VINE
STATUS: LIKELY INVASIVE

Pale Swallow-wort; European Swallow-wort

Cynanchum rossicum (Kleopov) Borhidi

Synonym:

Vincetoxicum rossicum (Kleopov) Barbarich

Photos by Leslie Mehrhoff, IPANE

Identification: Pale Swallow-wort is **very similar in all respects to the Black Swallow-wort except its flower corollas are pale yellow to pinkish-purple with lobes that are longer (2x as long as wide) and glabrous above.**

Distribution: In Massachusetts it occurs in the southern Connecticut Valley and at locations in the Boston area. It is less widespread in New England than Black Swallow-wort, but has been reported in Connecticut, Maine, and New Hampshire. In Connecticut it may be more frequent than Black Swallow-wort. **Origin:** Europe.

VINE
STATUS: LIKELY INVASIVE

Japanese Hops

Humulus japonicus
Sieb. & Zucc.

John Randall, The Nature Conservancy

Family: Hemp (Cannabaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: An annual vine up to 2.5 m (8′) in length. Stems and leaves are rough-textured and covered in hooked hairs that can make handling painful. Leaves, variegated in some forms, are borne on **petioles that are usually longer than the blades. Leaf blades are palmately 5-9 lobed (upper with 3-5) with narrow, V-shaped gaps, heart-shaped bases, and apexes that taper to a sharp tip**. They are 5-12 cm (2-4.5″) long, finely toothed and possess stiff hairs on the veins below. Flowering is in early to mid summer with male and female flowers usually on separate plants. **Male inflorescences are erect and 15-25 cm (6-10″) long, while female spikes are small (to 2 cm), dull green, ovoid structures that mature to pendulous fruiting bodies with densely ciliate and spine-tipped bracts.** Fruits are yellow or brown achenes between the bracts.

Habitat: Japanese Hops grows in floodplain forests and riverbanks in full sun to partial shade where it may develop dense colonies. It also occurs in disturbed areas and open fields with moist soils.

Threat: It escapes from cultivation and is capable of prolific growth and out-competing native vegetation in invaded habitats. Skin contact with related common hops, and possibly Japanese hops, can cause dermatitis and blistering.

Rachel Kramer

Distribution: Japanese Hops grows along river shores of western Massachusetts and has been reported from all regions of the Commonwealth and all New England states. **Origin:** Asia.

Similar Species: Common Hops (*Humulus lupulus*), another non-native, is similar but its larger leaves are typically 3-5 lobed with open gaps, and the petioles are shorter than the leaf blades. Also, in Common Hops the bracts of the female spikes are entire.

VINE
STATUS: INVASIVE

Japanese Honeysuckle

Lonicera japonica Thunb.

Chuck Bargeron. UGA, in Bargeron, C.T. et al. 2003. Invasive Plants of the Eastern U.S. CD-ROM.

Family: Honeysuckle (Caprifoliaceae)

Regulated: Importation (July 1, 2006) and propagation/sale (January 1, 2009) prohibited

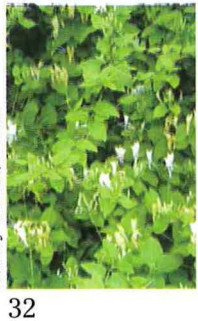
Identification: A **trailing or climbing woody vine** up to 9 m (30') long. **Stems are reddish brown and hairy when young. Older stems are hollow with flaky bark that peels in strips. Leaves are opposite, short-petioled, ovate, elliptic or oblong**, 4-8 cm (1.5-3") **long, and entire margined (sometimes lobed on vigorous new growth). Young leaves are often hairy, but may become smooth with age. In New England, it is semi-evergreen,** often losing its leaves in winter. **Flowers are highly fragrant and borne in axillary pairs** on short stalks arising from two leafy bracts. **Corollas are tubular,** 3-5 mm long, **distinctly 2-lipped, hairy, white to cream (occasionally pink or purplish) but become dull yellow with age.** A single style and five stamens extend well beyond the corolla tube. Berries are dark purple or black. Flowering occurs in the summer; fruiting in the late summer and fall.

Habitat: Japanese Honeysuckle grows and flowers best in full sun and rich soils, but can tolerate shade and nutrient poor soils. Often an early successional plant of open disturbed areas and thickets, it is also found in floodplains, and in forest edges and understories.

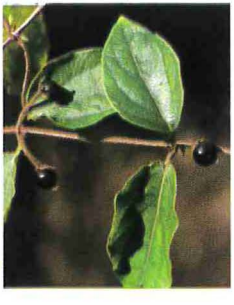
Threat: This species can dominate natural vegetation via root competition and by spreading rapidly through abandoned fields, roadsides, and young forests, strangling and smothering trees and shrubs and preventing the growth of seedlings and saplings. It can also take over forest canopies where natural disturbances have increased light availability.

Distribution: It occurs in all regions of Massachusetts, but is most common in the southeastern portion of the state. It occurs in every New England state. **Origin:** Asia.

Similar Species: Three other viney honeysuckles in New England have their uppermost leaves fused together around the stem. Trumpet Honeysuckle (*Lonicera sempervirens*) is a cultivated, red-flowered vine with orange-red berries. Native Wild Honeysuckle (*L. dioica*) and the non-native Grape Honeysuckle (*L. reticulata*) have short (< 3 cm) yellow flowers, mainly in terminal clusters, and leaves that are whitened below.



Stacey Leicht, IPANE



Ted Bodner. Southern Weed Science Society, in Bargeron, C.T. et al. 2003. Invasive Plants of the Eastern U.S. Univ. of Georgia, USDA APHIS PPQ, and USDA Forest Service, Forest Health Tech. Enterprise Team. FHTET-200-08 (CD-ROM)

VINE
STATUS: POTENTIALLY INVASIVE

Mile-a-minute Vine or Weed; Asiatic Tearthumb

Polygonum perfoliatum L.
Synonyms: *Persicaria perfoliata* (L.) H. Gross; *Ampelygonum perfoliatum* (L.) Roberty & Vautier; *Tracaulon perfoliatum* (L.) Greene

Les Mehrhoff, IPANE

Family: Buckwheat (Polygonaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: An **annual, herbaceous, clambering vine** with wiry branching stems up to 8 m (26') long and **armed with many downward pointing curved prickles; they are white or pale green initially but turn reddish with age. Leaves are alternately arranged** with each long petiole arising from a leaf-like sheath (an ocrea) encircling the stem. The upper ocreae are expanded upwards. Leaf blades are pale green, triangular, 3-8 cm long, **and attach to the petiole on the blade's underside just above the base. Flowers are in spike-like racemes** 1-2 cm long; the **flowers are small, greenish-white and often remain closed.** Green berries turn fleshy and iridescent blue as they ripen. The fruit is a round, shiny black achene inside each berry.

Habitat: Mile-a-minute is usually found in disturbed open areas, roadsides, and abandoned fields, but has been identified in a plant nursery and a butterfly garden. In Connecticut, it escaped a garden and invaded a nearby early successional forest. Habitats outside of New England include wet meadows, stream and woodlot edges, and roadsides.

Threat: It can grow about 6' per day and climb to 4 m (12') or more, forming dense overgrowths that can damage trees and other vegetation. It has the potential to compete with or even eliminate rare native plant populations. It is easily spread in nursery stock.

Distribution: It was discovered in 2006 on Cape Cod and in the Boston area; it is also present in Connecticut and Rhode Island. **Origin:** East Asia.

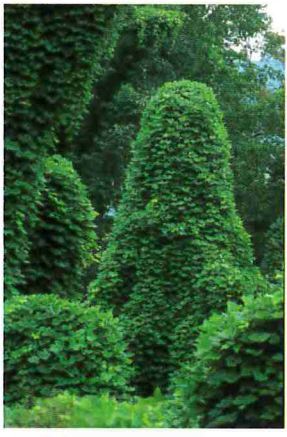
Similar Species: Two native *Polygonum* (or *Persicaria*) species have barbed stems similar to Mile-a-minute, but both are less viney and lack blue, succulent fruits and the leafy, expanded upward ocreae: Halberd-leaf Tearthumb (*Polygonum arifolium*) has triangular leaf blades but also basal leaf lobes directed outward (hastate) and Arrow-leaf Tearthumb (*P. sagittatum*) has basal lobes of the leaf blades directed backwards (sagittate).

Britt Slattery, U.S. Fish and Wildlife Service, Univ. of Connecticut, in Bargeron, C.T. et al. 2003. Invasive Plants of the Eastern U.S. Univ. of Georgia, USDA APHIS PPQ, and USDA Forest Service, Forest Health Tech. Enterprise Team. FHTET-200-08 (CD-ROM)

VINE
STATUS: LIKELY INVASIVE

Kudzu; Japanese Arrowroot

Pueraria montana (Lour.) Merrill
Synonyms: *Pueraria montana* var. *lobata* (Willd.) Maesen & S. Almeida; *Pueraria lobata* (Willd.) Ohwi



Barry Rice, The Nature Conservancy

Family: Bean (Fabaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A **perennial, semi-woody vine arising from a large tuber** and climbing to 30 m (100′). Woody brown stems are up to 10 cm (4″) thick while **herbaceous new growth is green with tan/bronze hairs. Leaves are alternate and long-petioled with 3 leaflets.** Leaflets are 10-15 cm (4-6″) long and up to 10 cm (4″) wide. **The terminal leaflet is broadly ovate and sometimes three lobed**; the lower pair are 1-2 lobed and asymetrical if 2-lobed. Leaflet undersides are hairy and the margins are entire. **Inflorescences are axillary racemes 10-20 cm (4-8") long. Flowers are grape-scented with reddish-purple corollas bearing yellow at the base of the upper petal.** Fruits are flattened hairy brown pods 4-5 cm (1.5-2") long.

Habitat: Kudzu grows in full sun to partial shade. It does best with high summer temperatures and mild winters and is most commonly found in disturbed areas, on roadsides, and along forest edges.

Threat: Its massive tubers can weigh up to 400 lbs and extend 9′ below the ground, allowing it to survive New England winters despite above ground portions being winter-killed. Each root crown can produce up to 30 vines or runners with the ability to root at nodes. Growing at a rate of approximately 30 cm (1′) per day, it can smother trees and other plants in a dense blanket of vegetation. It has proven to be a difficult and costly invasive species to control in the southeastern U.S.

Distribution: Kudzu is restricted to a few sites in the Boston area and coastal Massachusetts. It is also known from Connecticut in New England. **Origin:** E. Asia.

Similar Species: It is unlikely that Kudzu would be mistaken for any other semi-woody vine with three leaflets in Massachusetts.

David J. Moorhead, Univ. of Georgia, in Bargeron, C.T. et al. 2003. Invasive Plants of the Eastern U.S. Univ. of Georgia, USDA APHIS PPQ, and USDA Forest Service, Forest Health Tech. Enterprise Team. FHTET-200-08 (CD-ROM)

HERB
STATUS: INVASIVE

Goutweed; Bishop's Weed; Bishop's Goutweed

Aegopodium podagraria L.

Photo courtesy Invasive Plant Atlas of New England

Family: Carrot (Apiaceae)

Regulated: Importation (July 1, 2006) and propagation/sale/sale (January 1, 2009) prohibited

Identification: A **creeping perennial herb** 0.3-1 m (12-40") tall with glabrous stems and foliage. **Lower leaves** have long petioles with expanded bases and **9 ovate leaflets** with serrated margins. Upper leaves have shorter petioles and only three leaflets. Most horticultural varieties have white leaf margins, but the foliage of a commonly naturalized variety reverts easily to a solid deep green. Inflorescences occur in June and are 6-12 cm (2-4") wide **umbels of small, white, 5-petaled flowers**. The small 3-4 mm, pear-shaped fruits are ribbed and have two long, persistent styles that curve backward to the middle of the fruit body.

Habitat: Goutweed grows in partial sun to full shade and prefers moist, well- drained soils. It is tolerant of low-nutrient soils and can withstand a wide range of soil pH values. It may be found along roadsides, in waste places or cultivated ground.

Threat: Cultivated in New England as an ornamental or herbal plant, Goutweed primarily reproduces vegetatively via deep rhizomes and can spread aggressively when root zones are unrestricted or when its rhizomes or roots are fragmented by digging or natural disturbances. Rhizomes and seeds are dispersed by animals or flowing water, allowing the species to form dense new colonies, especially in floodplains.

Distribution: Goutweed is found in all regions of Massachusetts and throughout New England. **Origin:** Europe and northern Asia.

Chris Mattrick, NEWFS

Similar Species: It resembles a few native species in the carrot family. Golden Alexander (*Zizia aurea*), which also has lower leaves in threes, has finely serrated leaflets and bright yellow flowers. Canadian Honewort (*Cryptotaenia canadensis*) leaves possess three leaflets without petioles and flowers in white, irregular compound umbels. Aniseroot (*Osmorhiza longistylis*) stems and leaves are covered with fine, white hairs and the leaves and fruits have an anise smell. Sweet Cicely (*Osmorhiza claytonii*) is hairy like Aniseroot, and lacks the long, back curving styles present in Goutweed.

HERB
STATUS: INVASIVE

Garlic-mustard

Alliaria petiolata (Bieb.) Cavara & Grande

Photos by Rachel Kramer

Family: Mustard (Brassicaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A **biennial herb with a garlic odor** that can reach 1 m (3.3′) in height during its second growing season but is often half this height. **In its first year**, garlic mustard **appears as a basal rosette** of triangular to kidney-shaped toothed leaves with heart-shaped or rounded bases. These **leaves remain green through the winter. Mature plants have kidney-shaped lower leaves and triangular alternate upper leaves** that are 3-6 cm long and wide and coarsely toothed. **Button-like clusters of small white flowers appear in the early spring of its second year, each with four 5-6 mm long cross-shaped petals**. By May or June, linear, four-angled fruits 4-6 cm (1.0-2.5″) appear; each contains 10-20 shiny, black seeds. Second year mature plants survive through June, after which they become dry, pale stalks with seedpods that can retain seed through the winter.

Habitat: Garlic-mustard can grow in full sun or shade and commonly occurs in disturbed areas along the moist, shaded soils of floodplains, along roadsides, in forest openings, and along wood and trail edges. Its ability to tolerate shade can allow Garlic-mustard to dominate the forest understory.

Threat: It frequently occurs in habitats rich in native herbs. Each plant is capable of producing thousands of seeds, which may be dispersed by flooding or wind and remain viable in the soil for as long as five years. Garlic-mustard threatens certain native butterfly species by out-competing the native mustard host plants they rely on for egg laying and larval feeding.

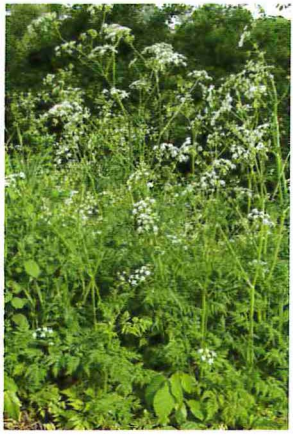
Distribution: Garlic-mustard occurs in all regions of Massachusetts and is reported in all the states of New England. **Origin:** Europe.

Similar Species: Coltsfoot (*Tussilago farfara*) leaves resemble the basal foliage of Garlic-mustard, but are white with hairs below. Broad-leaved Toothwort (*Cardamine diphylla*) is a white-flowered native mustard species in similar habitats. It is a small, 2-4 dm (8-16″) tall, perennial, however, and typically has only two stem leaves, each divided into 3 coarsely toothed leaflets.

HERB
STATUS: LIKELY INVASIVE

Wild Chervil; Chervil; Cow-parsley

Anthriscus sylvestris (L.) Hoffmann



Photos by Leslie Mehrhoff, IPANE

Family: Carrot (Apiaceae)

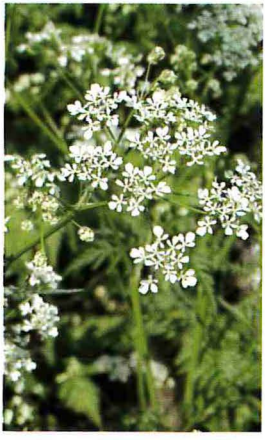
Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A **coarse biennial or short-lived perennial herb from a thick taproot with hollow stems** up to 1 m (3′) tall. **Alternate leaves have dilated petiole bases and triangular 2-3X pinnately compound blades that are fern-like in appearance** with 1.5-5 cm long segments, each with deeply cut serrated margins. **Inflorescences are large umbels** with 6-15 glabrous, 4 cm long branches. Narrow-ovate bractlets with ciliate margins appear below each small umbel. **Flowers have 5 notched creamy-white petals, two styles,** and bloom from May to June. **Fruits are smooth, lance-shaped, and measure about 6 mm including an apical beak about 1 mm long. They lack ribs except in the beak**, but have a vertical groove where the two halves of the fruit meet. The fruits start off green, but brown as they ripen.

Habitat: It grows in full sun to partial shade and may be found in old fields, wetlands, and along roadsides. The plant grows well in rich, moist soils and proliferates in floodplain soils.

Threat: Wild Chervil's relative height allows it to out-compete native species. Its seed may be widely dispersed from points of introduction by humans, animals, wind and vehicles. While it is a widespread weed in many places, it is especially frequent and abundant in central Vermont and river valleys in the Berkshires of Massachusetts.

Distribution: It has been reported from scattered sites in Massachusetts from Cape Cod to the Berkshires, as well as from all New England states. **Origin:** Europe, western Asia.



Similar Species: Other members of the carrot family that resemble Wild Chervil include Poison Hemlock (*Conium maculatum*) and the rare Hemlock-parsley (*Conioselinum chinense*). Poison Hemlock has purple-spotted stems and round fruits with prominent, wavy-margined ribs. Queen Anne's Lace or Wild Carrot (*Daucus carota*) often has one dark brown or purplish flower at the center of each umbel, and has ribbed bristly fruits.

HERB
STATUS: LIKELY INVASIVE

Bushy Rock-cress; Narrowleaf Bittercress

Cardamine impatiens

Photos by Leslie Mehrhoff, IPANE

Family: Mustard (Brassicaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A winter annual or biennial that may grow up to 8 dm (2.5′) tall. Erect stems, sometimes branched, bear numerous membranaceous leaves. ***Basal* leaves form rosettes, each with 2-4 pairs of leaflets. Stem leaves are sessile with ciliate arrowhead or ear-lobed shaped bases that clasp the stem**; each has 5-9 pairs of narrowly ovate or lance-shaped leaflets with teeth or lacerated margins. **Small flowers (2.5 mm) with either tiny white petals or petals absent** appear from May to June. Fruits are slender, 1.5-2 cm long (<1″), and each contains 10-24 seeds. They are borne on **erect, spreading stalks and ripen in the summer.**

Habitat: Bushy Rock-cress grows in full sun to full shade and is most commonly observed in shaded grasslands, rich woods, along shady forest edges, and on rocky ledges, roadsides and stream banks. The plant does well in habitats with moist soils.

Threat: It has the ability to explosively expel seeds from its fruits, allowing it to form dense colonies that compete with native plant species for critical resources. Because many habitats are vulnerable to invasion, any sightings of this species in New England should be reported.

Distribution: Bushy Rock-cress has been documented from Berkshire County, Massachusetts and has become widespread in Connecticut. It has been documented at isolated locations in Maine, New Hampshire and Vermont. **Origin:** Europe.

Similar Species: Native Pennsylvania Bittercress (*Cardamine pensylvanica*) and Small-flowered Bittercress (*Cardamine parviflora*) resemble Bushy Rock-cress in having small white-petaled flowers and pinnate compound leaves, but they lack arrowhead or earlobe-shaped leaf bases.

HERB
STATUS: LIKELY INVASIVE

Spotted Knapweed

Centaurea biebersteinii DC.; *Centaurea stoebe* L. *ssp. micranthos* (Gugler) Hayek Synonyms: *Centaurea maculosa* of various authors, not Lam.

Rachel Kramer

Family: Aster (Asteraceae)

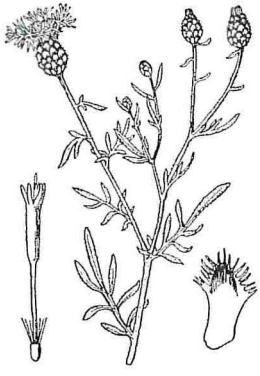
Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A tap-rooted, perennial herb 30-150 cm (1-5') tall. **First year plants produce a basal rosette of short petioled, deeply lobed leaves. In subsequent years they produce stems and alternate leaves with dense gray hairs.** Leaves become smooth with age, revealing resinous gland dotted surfaces. **Lower stem leaves are petiolate and divided 1-2 times into linear or oblong segments. Middle and upper leaves are sessile and dissected into linear pinnatifid segments.** Solitary, thistle-like flower heads, 1.5-2.5 cm across, each with 30-40 small, tubular pink-purple flowers, terminate branches from June-October. Outer bracts of the flower head have dark tips fringed with 5-7 pairs of stiff cilia.

Habitat: Spotted Knapweed grows aggressively in full sun and well-drained soils, especially sandy ones in both coastal and upland areas. Once established in disturbed sites such as fields, open areas, along roadsides and sandy riverbanks, it spreads to undisturbed natural areas.

Threat: Because Spotted Knapweed is a serious problem in grasslands of the western United States, there is concern that it will spread to undisturbed natural grasslands in New England. It decreases competing vegetation by releasing a compound that retards the root growth of surrounding plants. Large populations promote soil erosion because Spotted Knapweed roots have poor soil-binding abilities.

Distribution: Spotted Knapweed occurs in all regions of Massachusetts and is widely distributed in New England. **Origin:** Europe.



Similar Species: Other *Centaurea* species have been introduced to Massachusetts, but they differ in leaf shape (not pinnatifid with narrow segments), flower color, or have long, spine-tipped flower head bracts. Thistles (*Cirsium* spp.) also have pinkish-purple composite flower heads, but can be distinguished by their spiny leaves and often by their large 1.5-5 cm flower heads. Native Northern Blazing Star (*Liatris scariosa var. novae-angliae*) has flower heads in a dense vertical spike.

Britton, N.L., and A. Brown. 1913. *Illustrated Flora of the Northern States and Canada*. **Vol. 3: 558.**

HERB
STATUS: LIKELY INVASIVE

Hairy Willow-herb; European Fireweed; Codlins and Cream

Epilobium hirsutum L.

Photo courtesy www.aphotoflora.com

Family: Evening Primrose (Onagraceae)

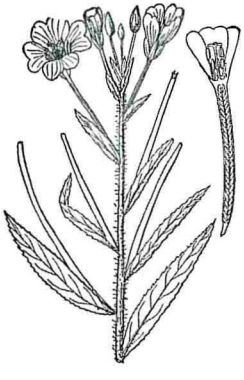
Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A **rhizomatous perennial herb with erect, much branched, densely hairy stems** between 5-20 dm (1.5-6.5′) tall. **Leaves are lanceolate to oblong, mostly opposite (but the inflorescence bracts alternate), often sessile or with clasping bases, minutely serrated margins, and soft pubescence on their surfaces.** The larger leaves are 5-12 x 1-3 cm (2-5″ long x 1″ wide). The **showy flowers are in short racemes and display four, shallowly notched reddish- or pinkish- purple petals and a four-parted stigma. Fruits are slender, elongate** structures 5-8 cm (2-3″) long **that open linearly into four valves bearing seeds with tufts of long white hairs** that aid in wind dispersal.

Habitat: Hairy Willow-herb grows in sunny environments with moist to wet soils. It is usually found in wetlands such as buttonbush swamps, fens, and other semi-aquatic environments.

Threat: The plant spreads vegetatively via rhizomes as well as by seed. The seeds are dispersed by wind and water. Although further evidence is needed to demonstrate the extent to which this species outcompetes other vegetation in minimally managed habitats, it can form large, nearly monotypic stands in wetland habitats of Massachusetts.

Distribution: Hairy Willow-herb occurs in all regions of Massachusetts and is present in every state of New England. **Origin:** Eurasia and North Africa.



Similar Species: The native Fireweed (*Epilobium angustifolium*) resembles Hairy Willow-herb and grows in open, moist soils, but its stems are largely unbranched and nearly glabrous except in the inflorescence. Its leaves are also alternately arranged. Other fireweeds in our region are not as robust and have less showy flowers.

Britton, N.L., and A. Brown. 1913. *Illustrated Flora of the Northern States and Canada.* Vol. 2: 591.

HERB
STATUS: LIKELY INVASIVE

Cypress Spurge

Euphorbia cyparissias L.

Paul Somers, NHESP

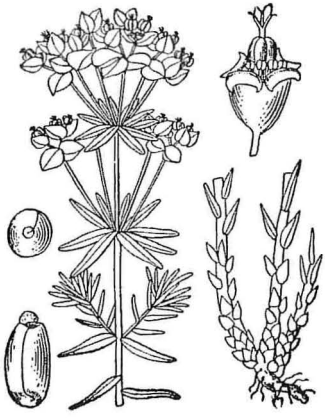
Family: Spurge (Euphorbiaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A perennial **1.5-4 dm (6-16″) tall** with an **extensive underground root system** that forks frequently. **Narrow, alternate leaves are one-nerved, bright pale green, and numerous; those of the main stem** are up to **1-3 cm (0.5-1″) long and less than 3.0 mm wide. Leaves are especially crowded on lateral shoots which eventually overtop the inflorescence. Stems and leaf veins exude a white juice when broken or cut. Umbel-shaped inflorescences bloom** from May-August, often reddening as they age. Minute flowers are borne in cup-like structures called cyathea (a spurge characteristic) on pedicels above pairs of **bright yellow, ovate, petal-like bracts.** The cyathea have 4 crescent-shaped glands around their rims. Fruits, which seldom fully develop in New England, are tiny capsules with 3 brownish-gray seeds.

Habitat: Cypress Spurge grows in full sun and is commonly observed in abandoned fields, disturbed open areas and natural grassland habitats such as the sandplain grasslands of Cape Cod and the islands of Massachusetts.

Threat: It can persist in open areas, and the plant's ability to vegetatively reproduce via lateral root growth allows it to spread rapidly from any point of introduction into natural habitats such as sandplain grasslands. It is toxic to grazing livestock and the latex can cause dermatitis in humans. More evidence is needed to show how seriously it competes with native vegetation in minimally managed habitats in the northeast.



Distribution: It occurs throughout Massachusetts and New England. **Origin:** Eurasia.

Similar Species: It closely resembles another invasive species, Leafy Spurge (*Euphorbia esula*), which can be distinguished by its larger size. It grows up to 7 dm (2′) tall, has principal stem leaves 3-8 cm long and 3-10 (-15) mm wide, and its lateral shoots do not overtop the inflorescence.

Britton, N.L., and A. Brown. 1913. *Illustrated Flora of the Northern States and Canada.* Vol. 2: 474.

HERB
STATUS: INVASIVE

Leafy Spurge; Wolf's Milk

Euphorbia esula L.

William M. Ciesla, Forest Health Mgt. International, www.forestryimages.org

Family: Spurge (Euphorbiaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: An erect, branching perennial, **3-9 dm (1.0-2.2′) tall**. It frequently grows in **dense colonies from horizontal rhizomes** that may extend many feet under the ground. **When cut or damaged**, this plant, like other spurges, **exudes a white milky sap**. Frosted or **bluish-green linear leaves** are 3-8 cm long and 3-10 mm wide (1-3″ long x <0.3″ wide), alternately arranged on the main stem and opposite in the flowering branches. Like all spurges, the flowers are reduced and appear in cup-like structures (cyathea) atop umbel-like structures. Pairs of showy cordate or **kidney-shaped bracts** become evident in the spring **below each small, cup-like flower cluster. These soon turn** yellow or yellow-green, thus becoming more evident in the summer. Warty, three lobed fruits produce a single seed per chamber.

Habitat: Leafy Spurge grows in full sun and tolerates moist to dry soil conditions. It is especially aggressive in drier soils. It occurs in disturbed areas, abandoned fields, pastures and roadsides as well as in open coastal habitats of Massachusetts.

Threat: It is a major weed on western rangeland and toxic to livestock. Leafy Spurge displaces native species by shading, monopolizing available water and nutrient resources, and producing toxins that inhibit growth of other plants. It has a high seed germination rate (seeds remain viable for seven years or more) and the ability to spread vegetatively from extensive rootstocks. Its seed capsules open explosively to spread seed as far as 4.5 m (15′) from the parent plant.

Distribution: It occurs in all regions of Massachusetts and in disturbed areas throughout New England. **Origin:** Europe and temperate Asia.

Leslie Mehrhoff, IPANE

Similar Species: Cypress Spurge (*Euphorbia cyparissias*) resembles Leafy Spurge and is more common in New England. It is shorter (typically less than 40 cm (16″), and has shorter (1-3 cm) and narrower (1-3 mm) linear-shaped leaves. The leaves of lateral shoots are especially dense on Cypress Spurge, and these can eventually overtop the flowering portion of the plant.

HERB
STATUS: INVASIVE

Sea or Horned Poppy; Yellow Hornpoppy

Glaucium flavum Crantz

Stacey Leicht, IPANE

Family: Poppy (Papaveraceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A short-lived perennial or biennial herb with stout, stiff stems that can reach 0.9 m (3′), but are typically about 0.3 m (1′) tall. **Cut stems yield an orange-yellow juice. Leaves are firm, glaucous and covered in fine hairs.** The **lower leaves are petioled** and oblong but deeply lobed; **the upper are sessile**, ovate or heart-shaped with wavy toothed margins and clasping bases. Flowers are solitary on terminal branches arising from upper leaf axils. Each 5 cm (2″) **flower has four bright yellow or yellow-orange petals. Long (up to 1′), often curved, capsules** follow flowering in the summer and give the species its common name. They **open from the top downward**.

Habitat: This invasive poppy grows in full sun and is generally found in sandy, or cobbly, nutrient-poor soils that are dry or well drained. The plant is commonly observed in coastal areas below cliffs and dunes and above the wrack line on beaches. It also invades open disturbed areas and roadsides.

Threat: Sea or Horned poppy forms dense stands and crowds out native plant species, including some rare ones that have adapted to coastal environments.

Distribution: In Massachusetts, it occurs on coastal shores of the southeastern counties, such as the beaches of Cape Cod, Nantucket, and the Elizabeth Islands. Elsewhere in New England, it is restricted primarily to coastal areas of Connecticut and Rhode Island. **Origin:** Coasts of southern and western Europe, N. Africa and the Black Sea region.

Paul Somers, NHESP

Similar Species: Celandine (*Chelidonium majus*) is an introduced weedy herb in the poppy family with less firm, glaucous leaves, smaller yellow flowers, and shorter cylindric fruits (only 3-5 cm) that open from the base upwards. Wood or Celandine Poppy (*Stylophorum diphyllum*) is another non-native poppy that is sometimes cultivated. It has non-pubescent leaves and significantly smaller flowers (about 1″across) and elliptical, bristly fruit.

HERB
STATUS: LIKELY INVASIVE

Giant Hogweed; Giant Cow-parsnip

Heracleum mantegazzianum
Sommier and Levier

Barbara Tokarska-Guzik, www.forestryimages.org

Family: Carrot (Apiaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A very large biennial or one-time blooming perennial 2-5 m (6-15′) tall. **The stem is hollow**, 5-10 cm (2″-4″) in diameter, has coarse hairs, raised nodules, and often has purple blotches. The **alternately arranged hairy leaves are very large, up to 1.5 m (5′) across and divided into three leaflets or sometimes 5-7 pinnately arranged, sharply toothed, lobed leaflets.** The petiole forms a leaf sheath that is >1 cm wide. The plant produces **dramatic white, flat-topped umbels up to 60 cm** (2′) in diameter in June-July. The **rays** (branches) **of the main umbel number from 50-150.** Fruits are elliptic, 8-11 mm long, and strongly compressed with winged margins.

Habitat: Giant Hogweed is most commonly found along stream banks, roadsides and in disturbed areas. It prefers rich, moist soils and grows in full sun or shade.

Threat: Introduced as a garden curiosity, it outcompetes native plant species in the Pacific Northwest, especially in riparian habitats where its seeds are dispersed by water. It is a new introduction in New England, but might behave similarly here. Giant Hogweed is extremely difficult to remove manually. Skin exposure to its toxic sap may result in severe burns, blistering and heightened UV sensitivity.

Distribution: It occurs in scattered sites throughout Massachusetts and has been identified in Connecticut, Vermont and Maine, as well. **Origin:** Eurasia (Caucasus Region).

Similar Species: Some members of the carrot family resemble Giant Hogweed, but are smaller (1-3 m). The native Cow Parsnip (*Heracleum maximum*) grows to 2.5 m, has stems that are uniformly green or purplish, and leaves with three leaflets and fine, soft hairs. Native Purple-stem Angelica (*Angelica atropurpurea*) has umbellate, winged fruits, but the stems are glabrous and the leaves are distinctly pinnately compound. In both these species umbels are less than 20 cm wide. Some of the larger leaves of non-native Wild Parsnip (*Pastinaca sativa*) may be divided into several sharply toothed leaflets, but it produces yellow flowers.

Donna R. Ellis, Univ. of Connecticut, in Bargeron, C.T. et al. 2003. Invasive Plants of the Eastern U.S. Univ. of Georgia, USDA APHIS PPQ, and USDA Forest Service, Forest Health Tech. Enterprise Team. FHTET-200-08 (CD-ROM)

HERB
STATUS: INVASIVE

Dame's Rocket

Hesperis matronalis L.

Leslie Mehrhoff, IPANE

Family: Mustard (Brassicaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: An **erect biennial or perennial** 5-10 dm (1.5-3′) in height. **Leaves are alternately arranged** on the stem, 5-10 cm (2-4″) long, **lanceolate to lance-ovate in shape, and sharply toothed. Leaves higher on the plant are sessile or short-stalked, while lower leaves have obvious petioles.** Leaves are usually hairy on both upper and lower surfaces, with the lower hairs being chiefly branched. Fragrant flowers in terminal inflorescences appear in late May-June with the scent being most pronounced at the end of the day. Each **flower has 6 stamens and 4 purple, pink or white petals** measuring about 2-2.5 cm long. **Fruits are long, slender pods** 5-10 cm (2-4″) in length that contain many seeds in a single row on each side.

Habitat: Dame's Rocket grows in full sun to full shade and can form dense stands, particularly in floodplains. It is commonly observed in riparian habitats and wetland areas, as well as in open woods. It also occurs along roadsides, woodland borders, thickets and in waste places.

Threat: Although not native to North America, it is sometimes sold as part of "native" wildflower seed assortments. This plant's capacity for high seed production and rapid spread allows it to outcompete native vegetation and dominate natural areas.

Distribution: It occurs in all regions of Massachusetts and throughout New England. **Origin:** Europe.

Similar Species: A variety of Phlox species such as Garden Phlox (*Phlox paniculata*) may be confused with Dame's Rocket. Identify Phlox by its five petals (as opposed to four) fused into a corolla. It can sometimes be seen growing with another non-native member of the mustard family, Honesty or Money Plant (*Lunaria annua*), which also has purple to white flowers, but can be distinguished by its round, coin-shaped fruits and triangular-ovate leaves.

Britton, N.L., and A. Brown. 1913. Illustrated Flora of the Northern States and Canada. Vol. 2: 175.

HERB
STATUS: INVASIVE

Yellow Iris; Yellow Flag; Pale Yellow Iris; Water Flag

Iris pseudacorus L.

Karen Lombard, The Nature Conservancy

Family: Iris (Iridaceae)

Regulated: Importation (July 1, 2006) and propagation/sale (January 1, 2007) prohibited.

Identification: A **robust, clumping perennial** 0.5-1.2 m (1.5-4') tall. **Thick branching rhizomes are pink-fleshed and form dense horizontal mats. Leaves are stiff, erect, broad, sword-shaped, glaucous, and equal or surpass the stems. Flowers** are borne on erect stalks with 3-5 **bright yellow** 7-9 cm (2.5-3") wide flowers (range from pale yellow to almost orange). The glabrous sepals bend backward and are constricted at the base; **they are not crested like some irises**. The narrower petals are erect with a constricted middle. **Fruits are green, 6-angled, cylindric capsules**, 5-8.5 cm (2-3") long on arching pedicels and containing up to 120 flattened, D-shaped seeds that brown as they mature.

Habitat: Yellow Iris may form dense colonies in freshwater and brackish wetlands, such as floodplains or along lake, pond, river and stream shorelines. It can grow on sediment and organic litter along the margins of standing water, as well as in wet meadows, fens, swamps and salt marshes. It can tolerate full sun or light shade, highly acidic environments, well-drained to soggy soils, and having its crowns immersed in water up to 10" deep.

Threat: Its dense colonies can dominate a range of vegetation types, displacing native plants and animals and altering natural succession patterns. The plant contains large amounts of glycosides, especially in the rhizomes, that are toxic to wildlife.

Distribution: Yellow Iris occurs in all regions of Massachusetts and is recorded in every other New England state. **Origin:** Europe, Western Asia, North Africa and the Mediterranean region.

John Randall, The Nature Conservancy

Similar Species: There are no native iris species in New England that have yellow flowers. Blue Flag Iris (*Iris versicolor*) has purplish-blue, crested flowers and slightly smaller fruits (1.5-6 cm) on erect pedicels. When not in flower, the leaves of native Cattails (*Typha* spp.) may resemble those of Yellow Iris.

HERB
STATUS: INVASIVE

Broad-leaved Pepperweed; Tall Pepperweed; Tall Whitetop

Lepidium latifolium L.

Family: Mustard (Brassicaceae)

Regulated: Importation and propagation/ sale prohibited (January 1, 2006)

Identification: A rhizomatous **perennial that forms a woody crown at the soil line, and from which new shoots sprout.** Stems in mature colonies are mostly 0.7-1.5 (2.5-5') tall, but peripheral new stems are often much shorter. Old stems remain over winter with rosettes of leaves at the base. Stems and foliage are a smooth, waxy, bright or gray-green. **Toothed basal leaves have long petioles** and may be up to 30 cm (12″) long, while the **alternate stem leaves are sessile with few to no teeth and becoming substantially smaller up the stem. Inflorescences** consist of **many short terminal racemes. White flowers appear in early summer and flowering continues throughout the growing season**. Fruits are tiny (2mm), flattened, round, pod-like structures.

Habitat: This species can invade a range of natural habitats but seems especially well adapted to coastal wetlands. It forms dense stands in salt marshes, often above the high tide line. The invasive is also found in riparian habitats, along roadsides, in pastures and agricultural fields.

Threat: It can produce numerous seeds per plant and spreads vegetatively via rhizomes. As it expands, it forms vast, monospecific stands that displace native flora and fauna. It can raise the soil salt table, lower the quality of pasture for livestock, and adversely affect nesting habitat and food quality for native birds.

Distribution: In Massachusetts, it occurs in coastal areas primarily from towns south of Boston northward, but it has also been reported in non-coastal areas along the Massachusetts Turnpike in Middlesex and Worcester counties. **Origin**: Europe and western Asia.

Similar Species: No plant species bears a close resemblance to broad-leaved pepperweed. Other *Lepidium* species in Massachusetts are annuals possessing less developed rhizomes and root systems, and fruits that are distinctly notched at their apices. Most other mustard genera occurring in New England with similar flowers have fruits with a septum as wide as the fruit itself.

Photos by Leslie J. Mehrhoff, IPANE

HERB
STATUS: INVASIVE

Moneywort; Creeping Jenny

Lysimachia nummularia L.

John Randall, The Nature Conservancy

Family: Primrose (Primulaceae) or more recently Myrsinaceae

Regulated: Importation (July 1, 2006) and propagation/sale (January 1, 2009) prohibited

Identification: A **trailing, mat-forming perennial with creeping glabrous stems** that can grow up to 60 cm (2′) long and up to 10 cm (4″) high. **Opposite, nearly round leaves 1.5-3 cm (0.5-1.0″) in length occur on short, but distinct petioles. Showy yellow flowers appear singly on slender stalks rising from the leaf axils.** Flowers bloom from June-August, but in some years not at all. Each flower has 5 erect stamens fused at their bases and 5 spreading ovate petals that are each 10-15 mm long and often speckled with small, dark red dots. Flowers measure approximately 2-3 cm (1.0″) in width. Seeds are borne in capsule-like fruits.

Habitat: Moneywort grows in full sun to full shade. It usually grows in muddy soils along rivers and stream banks, damp roadsides, on pond shorelines, and in swamps, floodplains, meadows and ditches.

Threat: Often escaping from cultivation, this plant can form dense mats in open and forested floodplains and the muddy edges of wetlands. In suitable habitat, Moneywort spreads rapidly, potentially threatening native plant species. It spreads via dispersed seeds and stem fragments transported by water or animals.

Paul Somers, NHESP

Distribution: Moneywort occurs throughout Massachusetts and New England. **Origin:** Europe and southwestern Asia.

Similar Species: Native Partridgeberry (*Mitchella repens*) is a common creeping herbaceous plant that may be confused with Moneywort when not in flower or fruit. Partridgeberry, however, has smaller round leaves with prominent white midveins and produces white, terminal flowers and attractive red berry-like fruits.

HERB
STATUS: INVASIVE

Purple Loosestrife

Lythrum salicaria L.

Leslie Mehrhoff, IPANE

Family: Loosestrife (Lythraceae)

Regulated: Importation and propagation/sale prohibited (Jan. 1, 2006)

Identification: A **wetland perennial herb** 0.5-1.5 m (1.5-5′) tall with erect stems. **Stems are 4-6 sided and usually quite hairy. Leaves are opposite or arranged in whorls of 3, narrowly lance-shaped,** 3-10 cm (1-4″) long, **sessile, and heart-shaped or rounded at their bases. Terminal or upper axillary spikes of numerous magenta flowers in whorled clusters bloom from July to September. Flowers typically have 6 petals but the number can vary from 5 to 7**; the stamen number is most often 12 but can also vary. The pubescent calyx has long linear appendages alternating with the much shorter sepal lobes. Seeds are reddish-brown and contained in dry, bilobed capsules.

Habitat: Purple Loosestrife spreads prolifically in open, disturbed sites with moist soils or even shallow standing fresh water, but also invades undisturbed wetland ecosystems, such as marshes, wet meadows, fens, and floodplains. It is tolerant of a wide variety of moisture, pH, and nutrient conditions, but prefers slightly acidic or neutral soils.

Threat: Mature plants are capable of annually producing an estimated 2.5 million seeds that can persist in wet soils for many years. Purple loosestrife is known to outcompete native wetland plants, forming vast, dense stands that restrict native plant species and thus reduce vegetation important to indigenous wildlife for nesting and feeding. Large or dense populations may clog waterways, too, preventing the commercial and recreational use of the affected wetlands.

Rachel Kramer

Distribution: It occurs in all regions of Massachusetts and is widely distributed throughout New England. **Origin:** Eurasia.

Similar Species: Non-native Wand-loosestrife (*Lythrum virgatum*), the species most similar to Purple Loosestrife, has been documented only from Norfolk County. It is smooth throughout and the leaf blades taper to the base. Winged Loosestrife (*Lythrum alatum*), which may be a rare native in Berkshire County, has single or paired flowers in the axils of leaves, many of which are alternate on the stems. Fireweed (*Epilobium angustifolium*) is superficially similar with pinkish-purple flowering spikes, alternate minutely toothed leaves and 4-petaled flowers.

HERB
STATUS: LIKELY INVASIVE

Forget-me-not; True Forget-me-not; Water Scorpion-grass

Myosotis scorpioides L.

Rachel Kramer

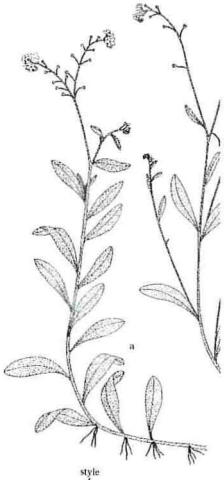
Family: Borage (Boraginaceae)

Regulated: Importation (July 1, 2006) and propagation/sale (January 1, 2007) prohibited

Identification: A **creeping, often stoloniferous, perennial** with angular, fleshy stems that can reach 2-6 dm (8-24″) long or tall. **Rough hairy leaves** are 2.5-8 cm (1-3″) long, **sessile or nearly so, and vary from oblanceolate at the base to oblong or elliptic above. Inflorescences appear above the leaves on curving, divergent racemes that uncoil as they bloom. Flower corollas are tubular at their bases** but abruptly expand into **5 sky-blue lobes,** measuring 5-10 mm across **with a yellow or sometimes pink or white eye at the center.** The calyx has hairs that are short, straight and appressed, and lobes that are generally shorter than the fused basal portion. Fruits consist of seed-bearing nutlets that are angled on one side. The style overtops the nutlets.

Habitat: The species grows in wet habitats in full sun or shade. Forget-me-not is often seen along stream and riverbanks, in herbaceous wetlands, wet meadows and floodplain forests.

Threat: Still a common garden plant, it escapes from cultivation and may become prolific in open wooded stream areas, stream-banks and wet meadows. Its fruits can be water-dispersed across great distances. Evidence regarding this plant's persistence in northeastern habitats is needed.



Distribution: Forget-me-not occurs in all regions of Massachusetts and is reported in every state of New England. **Origin:** Europe and western Asia.

Similar Species: Native American or Wild Forget-me-not (*Myosotis laxa*) resembles this Forget-me-not and occurs in similar wet habitats, but has smaller flowers measuring 2-5 mm in diameter, round stems that are not stoloniferous, and calyx lobes as long as or longer than the fused basal portion of the calyx. All other species of Forget-me-not in Massachusetts and New England have spreading hooked hairs on the calyx and are found in mesic to dry soils.

Fassett, Norman C. 1957. A Manual of Aquatic Plants. © Reprinted by permission of The University of Wisconsin Press.

HERB
STATUS: INVASIVE

Japanese Knotweed; Mexican Bamboo; Japanese Fleece Flower

Polygonum cuspidatum
Synonyms: *Fallopia japonica, Reynoutria japonica*

Photos by Paul Somers, NHESP

Family: Smartweed (Polygonaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: An **upright perennial herb with multiple, dense shoots** that can grow up to 3 m (10′) in height. **Like a bamboo, stems are stout, round and hollow, with swollen joints at leaf nodes.** Shoots grow from stout subterranean rhizomes that may spread horizontally as far as 20 m (65′). **Broad leaves**, measuring up to 18 cm long and 10 cm wide, have truncate bases, **abruptly acute tips**, and veins below are roughened with minute, swollen knobs. White or **greenish-white flowers** appear August-September in numerous branched clusters. Fruits are small, shiny, black triangular seed-like achenes enclosed by papery thin and angled flower remnants (sepals).

Habitat: Japanese Knotweed grows in full sun to full shade, but is hardier in full sun environments. It is tolerant of drought, high temperatures and high salinity levels, and intolerant of frost. Often found near water sources, this plant may be observed in wetlands and other riparian areas. It commonly grows along streams, riverbanks, and in disturbed areas, roadsides and waste places.

Threat: It spreads vegetatively and by seed, forming dense thickets that threaten native plant communities in wetlands and riparian areas. It has the ability to survive severe flooding and readily colonizes island habitats and shorelines. Once established, its populations are highly persistent and difficult to eradicate.

Distribution: It occurs in all regions of Massachusetts and throughout New England. **Origin:** East Asia.

Similar Species: Giant Knotweed (*Polygonum sachalinense*) is a similar non-native weed that resembles Japanese Knotweed. Giant Knotweed leaves are considerably larger, up to 36 cm long, and the mid-stem leaves have deeply cordate bases and under-surface veins with multicellular hairs (seen with a handlens). Hybrids between Japanese and Giant knotweed (*P. x bohemicum*) and backcrosses also exist; they typically have slightly cordate leaves ranging from 20-36 cm long.

HERB
STATUS: INVASIVE

Lesser Celandine; Fig Buttercup; Pilewort

Ranunculus ficaria L.

Leslie J. Mehrhoff, IPANE, Univ. of Connecticut. Invasive Plants of the Eastern U.S. CD-ROM.

Family: Buttercup (Ranunculaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

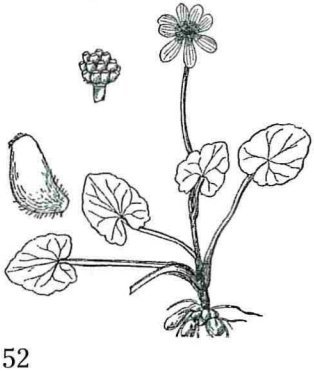
Identification: A **perennial, low-lying herb** typically only 5-15 cm (2-6″) tall, but ranging up to 30 cm (12″). The plants reproduce readily from **multiple fleshy tubers at their bases and from small cream-colored bulblets produced in leaf axils along the stem. Glossy, dark green leaves are up to 4 cm (1.5″) long, long petioled, heart or kidney-shaped with wavy margins,** and often marked with silver, bronze, or blackish purple. **Flowers, typically solitary**, appear in late April to early May, have 3-4 green sepals and 8-12 **glossy, butter-yellow petals.** Each flower produces numerous beakless achenes.

Habitat: Lesser Celandine grows in full sun or shade and does well in moist soils. Forested floodplains and streambanks are especially susceptible to incursion by this plant, but it is also commonly observed along woodland edges, roadsides and other disturbed areas.

Threat: Infestations of this plant can resemble dense green carpets with yellow spots covering entire expanses of the forest floor. Propagating both vegetatively and by seed, Lesser Celandine outcompetes native spring wildflowers, especially in riparian woodlands. It emerges in the spring well before most native species, allowing it to rapidly overtake areas, then dies back completely in early June.

Distribution: Lesser Celandine infestations are mainly in eastern Massachusetts, but it occurs statewide. Now widely distributed in New England, this plant has not yet been reported in Vermont or Maine. **Origin:** Europe.

Similar Species: Lesser Celandine resembles native Marsh Marigold (*Caltha palustris*) in leaf shape and bright yellow flowers. Marsh Marigold, however, is a larger, hollow-stemmed wetland plant that does not produce bulblets or tubers. This native can form dense stands like Lesser Celandine, but the plants produce up to 7 flowers that have 5-9 yellow sepals and beaked achenes. Among buttercups, Lesser Celandine can be distinguished by its simple, unlobed leaves and the presence of only 3-4 green sepals.



Britton, N.L., and A. Brown. 1913. *Illustrated Flora of the Northern States and Canada.* Vol. 2: 117.

HERB
STATUS: LIKELY INVASIVE

Creeping Buttercup

Ranunculus repens L.

Leslie Mehrhoff, IPANE

Family: Buttercup (Ranunculaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

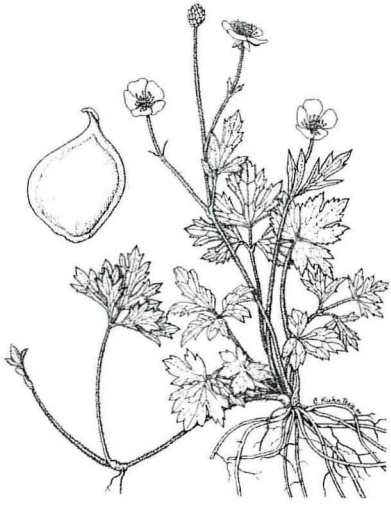
Identification: A **low-lying, creeping perennial with stems that develop roots at nodes**. Basal **leaf blades** are petioled, up to 8.5 cm (3.5″) long and 10 cm (4″) wide, with 3 distinct leaflets or segments, each lobed or parted and **sharply toothed on the margins**. The terminal leaf segment is stalked. **Bright yellow,** 2.5 cm (1″) wide **flowers** are borne from May-July. Flowers display spreading sepals and 5-7 petals, each 8-15 mm long. The plant's **tiny, spherical fruits (achenes) have curved beaks** 0.8-1.2 mm long.

Habitat: Creeping Buttercup grows in full sun to full shade and is common around springs and wetlands, but it also occurs in habitats ranging from roadsides to wet meadows. It prefers rich, damp soils, but may also grow in moist gravel or sand.

Threat: It forms dense carpets that are thought to crowd out native plant species. Further evidence is needed to document the extent to which it outcompetes native species in minimally managed habitats.

Distribution: It occurs throughout Massachusetts and New England.
Origin: Eurasia.

Similar Species: Creeping Buttercup may be confused with the native Swamp Buttercup (*Ranunculus hispidus var. caricetorum*). Swamp Buttercup also roots at the lower nodes, but it has longer (0.8-2.6 mm), nearly straight beaks on the achenes. A number of non-native buttercups also resemble the species: Common Buttercup (*Ranunculus acris*) is generally taller and has leaf blades that are deeply and palmately cut into unstalked segments. Distinguish Bulbous Buttercup (*Ranunculus bulbosus*) by its erect, bulbous based stems and subterranean corms.

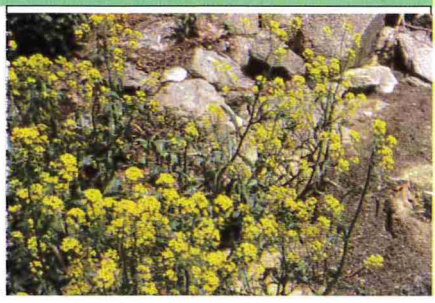


From Bulletin #446, printed with permission of the New York State Museum, Albany, N.Y.

HERB or AQUATIC PLANT
STATUS: LIKELY INVASIVE

Water Yellowcress; Great Yellowcress

Rorippa amphibia
(L.) Bess.



Robert Bertin

Family: Mustard (Brassicaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

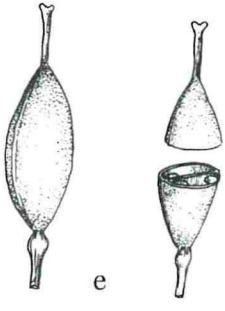
Identification: A **perennial, often aquatic, herb. Stems are hollow and either erect with ascending branches, or, in aquatic habitats, with stoloniferous, rooting and branching bases and long floating, creeping or loosely ascending branches. Leaves are lanceolate or oblanceolate and up to 12 cm long.** The **lower or submersed leaves are cut into narrow, unequal or equal comb-like segments; the upper are merely toothed, entire, or jagged on the margins. Inflorescences are corymbose or paniculate with yellow flowers.** The flowers are 8-10 mm long on spreading or slightly deflexed pedicels that are 1.0-1.7 cm long. The petals are about twice as long as the sepals. Fruits are 2-6 mm long, cylindric or elliptical two lobed structures containing many seeds.

Habitat: Water Yellowcress grows in wetlands in full sun to partial shade. Habitats include swamps and quiet, shallow water or shorelines of lakes, ponds or rivers, but the species can also be found on dry roadsides. It is sometimes grown in aquaria.

Threat: Water Yellowcress poses a serious threat to riparian habitats and may form dense stands in some locations.

Distribution: In Massachusetts, it has been documented from waterways in Worcester County, such as the Blackstone River. **Origin:** Eurasia.

Similar Species: There are a number of other *Rorippa* species with yellow flowers documented from Massachusetts. The native Marsh Yellowcress (*Rorippa palustris*) can be distinguished by its short petals; shorter than or equal to the sepals in length. Creeping Yellow Cress (*Rorippa sylvestris*) is a widespread introduced species with longer petals not unlike those of Water Yellowcress, but its middle and upper leaves are deeply cut and its fertile fruits are longer (1-2 cm). The Water-cresses (*Nasturtium* spp.) have white flowers and long slender fruits (1-2.5 cm). They also have stems that root freely from the lower nodes, and leaves that are divided into 3-9 ovate to round segments.



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Crow, G.E. and C.B. Hellquist. 1999. Aquatic and Wetland Plants of Northeastern North America. Vol. 1. © Reprinted by permission of The University of Wisconsin Press

HERB
STATUS: LIKELY INVASIVE

Tansy Ragwort; Stinking Willie

Senecio jacobaea L.

John Randall, The Nature Conservancy

Family: Aster (Asteraceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

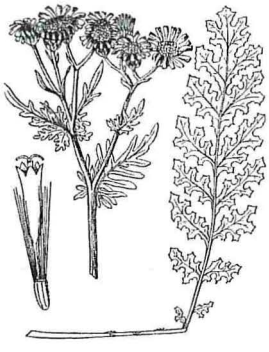
Identification: A perennial herb that may behave as a biennial in New England. Stems **(often tough and purplish tinged)** are 20-100 cm (8″- 3′) tall arising from a taproot. **Leaves are ovate,** up to 20 cm (8″) long, **deeply cut (often twice-cut), toothed on the margins, and alternately distributed along the stem. The leaves have petioles but the upper leaves are nearly sessile with lower lobes that often clasp the stem.** The **inflorescence has 20-60+ heads with yellow flowers** appearing in the summer that produce light brown achenes.

Habitat: Tansy Ragwort grows in sun or partial shade in a variety of soil types and is primarily found in open uplands such as pastures, roadsides and disturbed ground. It is also somewhat salt tolerant and usually relies on some form of disturbance to become established.

Threat: A significant problem species in the western U.S., it can poison livestock and other herbivores. It is capable of prolific seed production with larger specimens producing up to 250,000 seeds that can remain viable in the soil for up to 15 years. It is highly invasive in the Canadian Maritime provinces and, therefore, is considered a threat to coastal areas and interior grasslands in Massachusetts.

Distribution: In Massachusetts, Tansy Ragwort has been documented from one site in Worcester County and a few sites in the Boston area. It has also been documented from sites in Maine. **Origin:** Europe.

Similar Species: Tansy Ragwort resembles native ragworts including Golden (*Packera aurea*), Roundleaf (*P. obovata*) and Balsam (*P. paupercula)* Ragworts. These ragworts are not taprooted and have prominent undivided round, ovate, obovate, or oblong basal leaves and reduced, often deeply cut, upper leaves, whereas Tansy Ragwort leaves are mainly evenly distributed along the stem with any basal ones withering before flowering. Also, all its basal or lower leaves are deeply cleft and finely divided.



Britton, N.L., and A. Brown. 1913. *Illustrated Flora of the Northern States and Canada.* Vol. 3: 542.

HERB
STATUS: LIKELY INVASIVE

Coltsfoot

Tussilago farfara L.

Leslie Mehrhoff, IPANE

Family: Aster (Asteraceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A perennial 0.5-5 dm (1.5') tall, Coltsfoot is a **short plant with large, nearly round or heart-shaped leaves on petioles arising at the ground.** Leaves are 5-20 cm (2-8") long and equally wide, with a **deep, narrow basal sinus, toothed and shallowly lobed margins, glabrous upper surfaces, and white, wooly-haired undersides. Flowers appear in solitary heads atop scaly stalks (scapes) that shoot up from the plant's rhizomes in the early spring, before the leaves develop. Numerous small, yellow ray flowers** are located toward the perimeter of each flat-topped head, and sterile disk flowers occur in the center. The flowering **heads close at night (ray corollas arch and roll inward). Later they mature into white balls of tufted achenes that resemble those of Dandelions.**

Habitat: Coltsfoot grows in full sun to shade, thriving in partial shade. It is particularly problematic in limey seeps and damp, disturbed areas. It is well adapted to nutrient-poor, clayey, saturated soils and commonly occurs in pastures, open forests, and along riverbanks and roadsides.

Threat: It spreads via rhizomes, developing dense colonies with the potential to crowd out native plant species. Coltsfoot rhizomes can extend up to 0.5 m (1.6'), making it difficult to remove. Achenes are wind-dispersed and can travel great distances. Further evidence is needed to document the extent to which it outcompetes other plant species in minimally managed habitats in Massachusetts.

Distribution: It occurs in all regions of Massachusetts and is found throughout New England. **Origin:** Eurasia.

Paul Somers NHESP

Similar Species: Coltsfoot resembles the Common Dandelion (*Taraxacum officinale*). However, the Dandelion has elongate leaves and slender, smooth green flowering stalks. The threatened Sweet Coltsfoot (*Petasites frigidus* var. *palmatus*) has deep, palmately lobed leaves and multiple flower heads with whitish flowers atop each stalk. The basal leaves of garlic mustard (*Alliaria petiolata*) resemble those of Coltsfoot, but lack the woolly hairs below.

GRASS or SEDGE
STATUS: POTENTIALLY INVASIVE

Hairy Joint Grass; Jointhead; Small Carpetgrass

Arthraxon hispidus
(Thunb.) Makino

Photos by Leslie Mehrhoff, IPANE

Family: Grass (Poaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: An **annual grass with slender, sprawling or weakly ascending stems** up to 0.5 m (1.5′) or occasionally a meter long that often **root along their lower portions. The ovate or ovate-lanceolate leaves are stubby for a grass**, the larger lower blades measuring up to 7.5 cm (3″) long and up to 20 mm (0.8″) wide. **The lower leaf blades are heart-shaped and clasp the stem**. Leaf blades are flat and smooth or with only short stiff hairs on the undersides. **Inflorescences possess 12-20 branches that give a fan-shaped appearance if they are not tightly contracted**. Fruiting spikes are present in the late summer and fall.

Habitat: Hairy Joint Grass grows in full sun to partial shade and may be found along roadsides, shores, ditches, and in low woods and fields. It grows best in open, moist or wet habitats such as may be found in floodplain forests and along stream banks.

Threat: This grass may form dense stands that can displace native or naturalized vegetation. Native plant populations in sunny habitats with moist or wet soils, such as wetland borders, are therefore vulnerable.

Distribution: Although not currently thought to exist in Massachusetts, this invasive grass is historically known from Franklin County. In New England, Hairy Joint Grass has only been identified in Connecticut and Massachusetts. **Origin:** Asia.

Similar Species: Japanese Stilt-grass (*Microstegium vimineum*), an invasive grass, can be distinguished by its lack of heart-shaped, clasping leaf bases; they are wedge-shaped instead. Also its inflorescences have no more than 6 branches and they are typically enclosed in the upper leaf sheaths. Native Deertongue Grass (*Dichanthelium clandestinum*) is distinguished by its rhizomes, upright stems, longer leaf blades (10-25 cm), and larger, widely spreading inflorescences. Please note that many grasses require a technical key for positive identification.

GRASS or SEDGE
STATUS: POTENTIALLY INVASIVE

Japanese Sedge; Asiatic Sand Sedge

Carex kobomugi Ohwi

Photos by Leslie Mehrhoff, IPANE

Family: Sedge (Cyperaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A **stout perennial with bluntly 3-angled stems** 10-30 cm (4"-1') tall. Cord-like rhizomes can extend several feet, producing new shoots and forming dense colonies. **Stiff, leathery, yellow-green leaves arch slightly and have rough, minutely serrated edges**. Leaves are 3-6 (-8) mm wide, **commonly longer that the flowering stems, and persistent into the following year. Inflorescences are egg-shaped heads that appear to be a single spike but are really comprised of 3-20+ densely packed spikes.** Fruits are rounded, 3-sided achenes. Fruiting occurs in the spring and summer.

Habitat: This plant grows in full sun on coastal dunes, beaches and sandpits. It may also invade upper parts of storm-disturbed ocean beach flats. Sand burial is thought to stimulate rhizome growth. This sedge increases its habitat area by trapping wind-blown sand grains and establishing new dunes.

Threat: Japanese Sedge is capable of forming dense stands in coastal habitats. It outcompetes native coastal grasses, including dune-binding species like Dunegrass (*Ammophila breviligulata*), and reduces native plant diversity. It was planted for dune stabilization in the Mid-Atlantic region.

Distribution: Japanese Sedge has historically been found in Massachusetts only at a single location, a sandpit where it has not been relocated. Elsewhere in New England, it is only known from coastal Rhode Island.
Origin: Coastal eastern Asia.

Similar Species: *Carex macrocephala* is a very similar species native to Japan, Alaska and Washington; it has been introduced in New Jersey and has great potential to be invasive at our latitude. Muhlenberg's Sedge (*Carex muehlenbergii*), which is found in sandy soils throughout Massachusetts, has narrower leaves (2-4 mm wide), narrower inflorescences (8-12 mm), and achenes that are nearly round and biconvex. Dunegrass (*Ammophila breviligulata*) is a rhizomatous grass, but is stouter, taller, and lacks the triangular stems of Japanese Sedge. Please note that sedges usually require a technical key for accurate identification.

GRASS or SEDGE
STATUS: LIKELY INVASIVE

Hair Fescue; Fineleaf Sheep Fescue

Festuca filiformis Pourret

Kendra Buresch, The Nature Conservancy

Family: Grass (Poaceae)

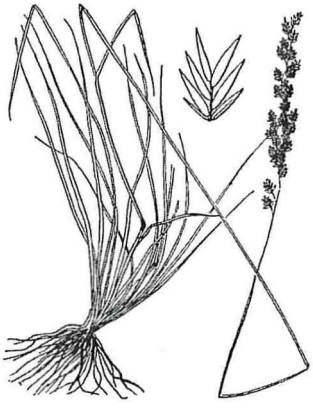
Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A **short, tufted perennial producing a few to many delicate stems** up to about 30-40 cm (12-16") tall. The many **wiry, hair-like leaves are mostly more than half as long as the flowering stems, and are rolled inward. Old leaf sheaths persist from the prior year and are intact at the base of the plants.** The inflorescence is a slender terminal, raceme-like structure with each spikelet on a short pedicel along the vertical axis. Spikelets consist of 3-8 florets and two short, narrow basal sterile bracts (glumes). The most conspicuous bract of each fertile floret (a lemma) is hardened, rounded on the back, 2.5-4 mm long, acute **and awnless or with only a short slender tip** less than 0.4 mm long.

Habitat: Grows in full sun to partial shade and can be common in minimally managed grassland habitats such as sandplain grasslands. It is also common in disturbed ground, especially where soils are sandy.

Threat: The tufts form dense mats in open grasslands and comprise a high percentage of the cover in many areas where this species is found. It has been documented in habitats with a number of state-listed rare plant species and is a possible threat to them. More data are required on the ability of Hair Fescue to outcompete native species.

Distribution: Hair Fescue occurs in all regions of Massachusetts and in all other states of New England. **Origin:** Europe.



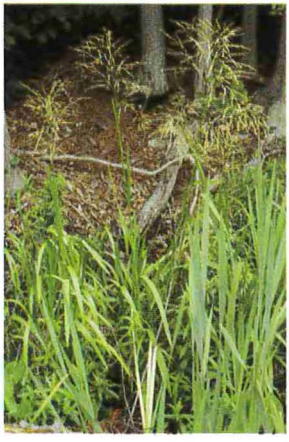
Similar Species: There are a number of other introduced, tufted fescues with leaves that are rolled inward in Massachusetts and New England. However, they all have conspicuously awned lemmas. Sheep Fescue (*Festuca ovina*) is a somewhat larger, more robust species in which the lemma awns are 0.5-2.5 mm long. Red Fescue (*Festuca rubra)* differs in being rhizomatous, having reddish leaf sheaths that disintegrate into fibers, and having conspicuous awns. Please note that many grasses require a technical key for accurate identification.

Britton, N.L., and A. Brown. 1913. *Illustrated Flora of the Northern States and Canada*. Vol. 1: 271.

GRASS or SEDGE
STATUS: LIKELY INVASIVE

Tall Mannagrass; Reed Mannagrass; Reed Sweetgrass; English Water Grass

Glyceria maxima (Hartman) Holmb. Syn: *Glyceria spectabilis*



Lou Wagner

Family: Grass (Poaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A **perennial, rhizomatous grass with stems up to 2.5 m (8') tall**. Stem bases are reddish. **Leaf sheaths have prominent midribs, visible cross veins, and are minutely** rough-textured. **Leaf blades are flat and shallowly grooved, with prominent midribs. They are 8-20 mm (<1") wide and up to 30 cm (1') long and have short, stiff hairs along their margins.** Forms with variegated leaves are in the trade. Inflorescences are open or sometimes contracted panicles 15-30 cm (6-12") long with branches bearing short, stiff hairs like those on the leaf margins.

Habitat: Tall Mannagrass grows in full sun to partial shade, but typically is found in open freshwater wetland habitats such as marshes, openings in shrub swamps, or the banks of slow-flowing rivers. The roots and rhizomes tolerate permanently saturated soils.

Threat: Tall Mannagrass growth starts early in the spring, giving it a competitive advantage over native wetland plants. It spreads primarily via rhizomes resulting in large, dense stands, but also produces viable seed. It is considered a poor wildlife food-plant and inadequate nesting vegetation for wetland wildlife, and thus may adversely affect habitat dynamics in invaded areas. As a forage plant, it has been implicated in several cases of cattle poisoning attributed to cyanide production in its young shoots.

Distribution: In New England, Tall Mannagrass is currently only known from wetland habitat adjacent the Ipswich River in Essex County, Massachusetts. **Origin:** Temperate Eurasia (British Isles to Japan).

Leslie Mehrhoff, IPANE

Similar Species: American Mannagrass (*Glyceria grandis*) resembles Tall Mannagrass, but is not as robust as its Eurasian cousin. Its stem bases are not reddish, and its leaf blades are narrower, 6-12 (-15) mm wide, and the leaf sheaths are smooth. Please note that many grasses require a technical key for accurate identification.

GRASS or Sedge
STATUS: LIKELY INVASIVE

Japanese Stilt-grass; Nepalese Browntop

Microstegium vimineum (Trin.) A. Camus

Chris Mattrick, NEWFS

Family: Grass (Poaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: An annual grass with weak stems that is typically in dense, low mats but may be 40-100 cm (16-40″) tall. It has **fibrous roots** and may root at nodes along the lower stem. **Leaf sheaths and stem nodes are mostly smooth, but the margins are fringed with small hairs. Leaf blades** are **lance-shaped with wedge-shaped bases** and measure 3-10 cm (2-4″) long and 8-15 mm wide; **they have white midveins and are smooth or slightly hairy. Inflorescences are either concealed in the upper sheaths or radiate out into 1-(2-4)-6 branches,** 3-7 cm (1-3″) long, that bear the flowers and fruits in pairs of spikelets. Flowering occurs in late summer and fruits mature in the fall as the plants are fading to pale-purple or yellowish after frost.

Habitat: Japanese Stilt-grass grows in full sun to full shade in moist or dry areas. It easily multiplies in disturbed areas and has been found to invade abandoned fields, roadsides, successional forests, floodplains and other habitats.

Threat: This grass often forms dense monocultures. Invasions are aided by the grazing of white-tailed deer, which eat native plant species while avoiding the Stilt-grass. Seeds are highly persistent in the soil. The seed and stem fragments are dispersed via water currents and by clinging to animal fur or clothing.

Distribution: Stilt-grass occurs in Connecticut, Rhode Island and in the southern towns and counties of Massachusetts near the Connecticut and Rhode Island borders. **Origin:** Asia.

Similar Species: Native Whitegrass or Cutgrass (*Leersia virginica*) is a perennial that produces scaly rhizomes in contrast to the fibrous roots of Stilt-grass. Its panicles have only one branch per node, and its leaf margins are rough. Hairy Joint-grass (*Arthraxon hispidus*) is similar in general appearance, but has lower leaves that are heart-shaped at the base and clasp the stems. Please consult a technical reference if in doubt of identification.

David J. Moorhead, Univ. of GA, www.forestryimages.org

GRASS or SEDGE
STATUS: LIKELY INVASIVE

Silver Plumegrass; Amur, Japanese, or Chinese Silvergrass

Miscanthus sacchariflorus (Maxim.) Franch.

Paul Somers, NHESP

Family: Grass (Poaceae)

Regulated: Importation (July 1, 2006) and propagation/sale prohibited (January 1, 2007)

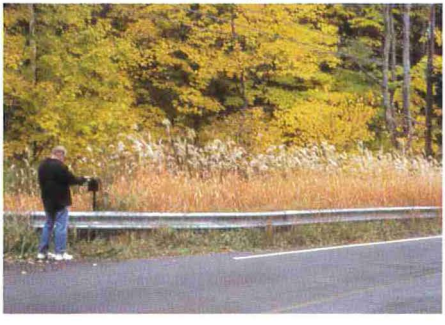
Identification: A **perennial grass producing many erect stems 0.6-2.5 m (3-8′) tall from scaly, elongated rhizomes.** Stem nodes are bearded with long hairs. Leaf blades are evenly distributed, 20-80 cm (8-32″) long and up to 3 cm (>1″) wide with prominent whitish midribs and long hairs on the upper surfaces basally. Large terminal panicles are feathery, white to yellowish-brown, and 15-40 cm (6-16″) long by 8-16 cm (3-6″) wide with 15 or more branches. **The inflorescences appear in late summer and have many long, silky, white hairs arising from and below the pediceled spikelets (they are 2-4 times longer than the spikelets). Awns are short or absent.**

Habitat: Silver Plumegrass prefers wetland sites, stream banks, pond edges and roadsides. It grows in full sun and is capable of tolerating a variety of soil types, including those with nutrient-poor or acidic conditions.

Threat: This species spreads via elongate rhizomes, developing dense stands along roadsides and in adjacent natural habitats, potentially crowding-out native plants.

Distribution: It is currently known from locations in the Connecticut Valley of Massachusetts and has been documented from Essex Co. In New England, naturalized occurrences have also been recorded in Connecticut and Maine. **Origin:** North-temperate regions of eastern Asia.

Similar Species: Eulalia or Japanese Silvergrass (*Miscanthus sinensis*) resembles it in having feathery inflorescences, but the plants are clumped due to shorter rhizomes and mainly basal foliage. Also, the hairs are <2X the length of the spikelets which have awns 6-12 mm long with a twisted base. Many cultivars of Eulalia, including a variegated one, are in the trade. Please consult a technical reference for further identification assistance if necessary.



Paul Somers, NHESP

GRASS or SEDGE
STATUS: INVASIVE

Reed Canary-grass; Ribbon-grass

Phalaris arundinacea L.

Rachel Kramer

Family: Grass (Poaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

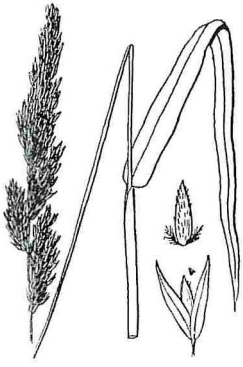
Identification: A robust, rhizomatous perennial grass 0.7-2.0 m (2-6.5') tall, with **blue-green stems.** Leaf blades are flat, elongate and 10-20 mm (<1") wide. A variety with white-striped blades (Ribbon-grass) also exists. **The terminal panicle is 7-25 cm (3-10") long and somewhat open at maturity, but is tightly contracted in fruit.** The spikelets are purplish when flowering but turn a dull tan with age. **The two conspicuous outer bracts (glumes) of the spikelets are keeled, compressed, and have incurved apices. They are nearly equal in length (4-6.5 mm) and envelop a single awnless, fruit-producing floret and two sterile bracts (lemmas).**

Habitat: Reed Canary-grass grows in full sun to partial shade. It prefers moist soils and is found along open streambanks, lakesides, and in marshes, meadows and fens. It also grows well in disturbed areas such as ditches, old fields and roadsides.

Threat: This species forms dense colonies that can overwhelm native plants or forage crops. It is of little food value to wildlife, and its dense vegetative cover may be poor habitat for many indigenous animals.

Distribution: It occurs throughout Massachusetts and New England.
Origin: Eurasia and areas of northern North America.

Similar Species: A few Reed-grasses, *Calamagrostis* spp., resemble Reed Canary-grass but they all have copious long hairs arising at the base of the florets, as well as awned lemmas. Feathertop (*Calamagrostis epigejos*) forms large colonies with dense panicles, but is distinguished by its silky hairs. Reed-bluejoint (*Calamagrostis cinnoides*) has narrower leaf blades (5-10 mm wide) and usually outcurved glumes. Canada Bluejoint (*Calamagrostis canadensis*) has a more open panicle and narrower leaf blades (4-8 mm). Common Reed (*Phragmites australis*) is typically 2-3 m (6-10') tall. Orchard-grass (*Dactylis glomerata*) has an inflorescence with a long, stiff lowest branch up to 10 cm long and dense one-sided clusters of spikelets borne at the end. Please consult a technical reference for further identification assistance.



Britton, N.L., and A. Brown. 1913. *Illustrated Flora of the Northern States and Canada.* Vol. 1: 170.

GRASS or SEDGE
STATUS: INVASIVE

Common Reed

Phragmites australis (Cav.) Trin. ex Steud. ssp. *australis*

Bill Byrne, *MassWildlife*

Family: Grass (Poaceae)

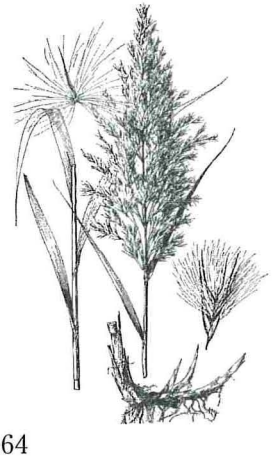
Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A large perennial grass typically 2-4 m (6-13′) tall that grows from long, thick, compressed creeping rhizomes 15 mm (0.6″) long. The stems form dense colonies and many old leaves can be seen at the base of plants from the stems of the previous season. The middle and upper parts of the stem are dull (tan during growing season) and ridged. Leaves are smooth, flat, gray-green or **dark green up to 50 cm (20″) long and 4 cm (1.5″) wide and tapering to a sharp point. Large, feathery, purplish inflorescences** are 40 cm (15″) long and appear from July to September. **These turn straw-colored in maturity.**

Habitat: Common Reed is found in open brackish and freshwater wetlands and occurs in either circumneutral or acidic environments. It often occurs at the interface between wetlands and uplands, particularly where there has been disturbance. It is common in roadside ditches and swales.

Threat: The native *genotype* (ssp. *americanus*) is a non-aggressive component of healthy, undisturbed wetland communities. The introduced genotype (ssp. *australis*) behaves aggressively, however, forming large, dense monocultures. It is easily transported on construction equipment. Dry stands of Common Reed become fire hazards as well.

Distribution: The invasive subspecies (ssp. *australis*) in our region is from Europe and Asia; the North American subspecies is rare and apparently declining in the northeastern United States. The invasive is found throughout Massachusetts and occurs in all the other states of New England. A couple small populations of the native ssp. *americanus* were recently documented on Cape Cod.



Similar Species: The native subspecies *americanus* can be distinguished by a number of features detailed at www.invasiveplants.net/Phragmites/morphology.htm and www.nps.gov/plants/alien/fact/pdf/phaul-powerpoint.pdf. Please consult a technical reference for further assistance.

Hitchcock, A.S. (rev. A. Chase). 1950. *Manual of the Grasses of the United States*. USDA Misc. Publ. No. 200. Washington DC.

AQUATIC
STATUS: INVASIVE

Carolina Fanwort; Fanwort

Cabomba caroliniana A.Gray

Paul Somers, NHESP

Family: Water-shield (Nymphaeaceae)

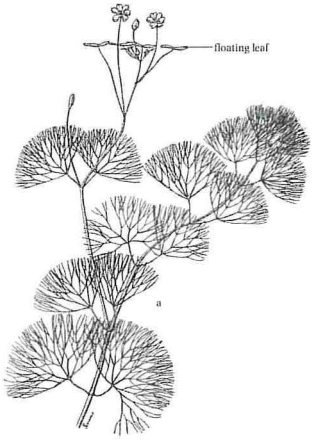
Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A **rhizomatous perennial** with branching stems over 2 m (6′) long. Plants bear **2 types of leaves: submersed opposite leaves on petioles with fan-like blades** about 5 cm (2″) wide **and divided into multiple, thread-like segments; and alternate floating leaves on long petioles** that attach to the undersides of small oblong or linear-elliptic blades < 2.5 cm (1″) long with a notched base. **Flowers are borne singly on slender peduncles arising from the axils of the floating leaves and are about 12-18 mm broad. They are generally white, but can be pink or purplish and have yellow spots at the base.** Fruits are a leathery, 2-(3)-4 parted structure.

Habitat: Carolina Fanwort habitat ranges from lakes and ponds to rivers and streams. It prefers stagnant water 3-10′ deep, but can survive in slow currents.

Threat: Common in the aquarium trade, it is often disposed of in wetlands and then spreads vegetatively and by seed. It has the ability to form dense stands, choking waterways and other shallow waters, and interfering with aquatic recreational activities. It spreads by attaching to boats and waterfowl and is capable of surviving below the winter ice.

Distribution: Carolina Fanwort has been reported in all regions of the Commonwealth and also occurs in Connecticut, New Hampshire, and Rhode Island in New England. **Origin:** South and Central America and southeastern United States.



Similar Species: Native Water Buttercup (*Ranunculus aquatilis*) may resemble Carolina Fanwort, but can be distinguished by its alternately arranged submersed leaves. Water-milfoils (*Myriophyllum* spp.) lack floating leaves and have dissected submersed leaves either in whorls or alternately arranged (not opposite), plus their dissected leaves have a prominent central axis unlike Fanwort's fan-like pattern.

Pamela Bruns Brayton, New Hampshire Agricultural Experiment Station, Univ. of New Hampshire.

AQUATIC
STATUS: LIKELY INVASIVE

Brazilian Waterweed; Brazilian Elodea

Egeria densa Planchon
Syn: *Anacharis densa* (Planch.) Victorin; *Elodea densa* (Planch.) Caspary

Barry Rice, TNC

Family: Frog's Bit (Hydrocharitaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A submersed, rooting or floating perennial with sparsely branched forking stems 1-3 mm wide. **Leaves are linear-oblong**, 10-40 mm (0.4-1.5″) long, **and generally occur in whorls of 4-6 per node, but can be found in pairs or threes below. The leaves are spreading but curve downward at the apex; they have a single mid-vein and are finely toothed on the margins. The flowers are unisexual and only staminate in our range**. The flowers **develop one at a time and are borne just above the surface on threadlike peduncles arising from spathes in upper leaf axils.** The **flowers have three, nearly round, white petals**, each 9-11 mm long, and 9 stamens; they bloom from summer through fall.

Habitat: Brazilian Waterweed grows in freshwater lakes, ponds and reservoirs up to 20' deep, and in slow-moving streams. In the Northeast it is most commonly observed in small ponds and does not seem to be negatively affected by winter temperatures.

Threat: It is sold in the aquarium trade and has spread rapidly in the U.S. through the dumping of aquarium contents into wetlands. Stem fragments are easily transported by boats, water or animals. Forming dense mats, it competes with native plants, alters fish habitat, and restricts commercial and recreational aquatic activities. It can also interfere with water flow by increasing sediment deposits, thus disrupting water supplies and irrigation systems.

Distribution: It occurs in only a few Massachusetts locations, all in eastern or southeastern regions of the state. It is also known from sites in Connecticut, New Hampshire and Vermont in New England. **Origin:** South America.

Leslie Mehrhoff, IPANE

Similar Species: Nuttall's Waterweed (*Elodea nuttallii*) and Canadian Waterweed (*Elodea canadensis*) resemble Brazilian Waterweed. These native waterweeds typically have only 3 leaves per whorl, but have 2-4 on occasion; and bear flowers with inconspicuous petals up to 4.5 mm long, barely longer than the sepals. Hydrilla leaves (see next page) have toothed midribs.

AQUATIC
STATUS: LIKELY INVASIVE

Hydrilla; Water-thyme; Florida Elodea

Hydrilla verticillata (L. f.) Royle

Leslie Mehrhoff, IPANE

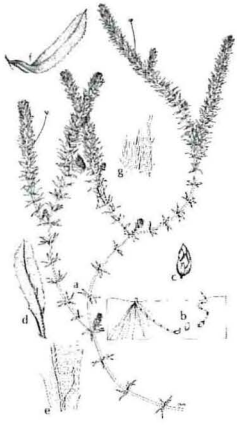
Family: Frog's Bit (Hydrocharitaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A **rhizomatous perennial with ascending, often branching submersed stems. Leaves occur in whorls of 3-8 around the stem. They are sessile, oblong or slightly elliptic,** 8-15 mm long x 1.2-4 mm wide, and have **serrated margins and a midvein leading to an acute apex. Prickles on the midvein below make fresh leaves noticeably rough.** Inflorescences are 1-flowered and the flowers are unisexual. The plants bear flowers of one or both sexes. Staminate flowers are short-stalked, detaching and floating to the surface. Female flowers come to the surface on stalks 1-5 cm long arising from spathes in upper leaf axils. **Flowers have 3 inconspicuous, translucent, whitish to reddish petals and 3 stamens.** Fruits are linear and cylindric. **Subterranean winter buds appear as cream-brown tubers,** and winter buds on the erect stems appear as olive-green propagules covered with short, stiff scales.

Habitat: Hydrilla grows in still or moving water up to 9 m (28′) deep, becoming established in ponds, lakes, reservoirs and rivers. Habitats range from fresh to brackish, acidic to basic, or mineral poor to eutrophic.

Threat: Hydrilla spreads easily by stem fragments and tubers transported by boats and waterfowl. It provides good habitat for some fish and shellfish species, but is a federally listed noxious weed. Dense infestations clog water bodies, interfering with recreation and displacing native plants. Its control and management in the southern states has cost millions.



Distribution: Hydrilla is currently found in only one pond in southeastern Massachusetts, but is also known from Connecticut in New England. **Origin:** Eastern Hemisphere.

Similar Species: It resembles Brazilian Waterweed (*Egeria densa*), but the leaves of the latter lack prickles on the midvein's underside and its flowers have 7-9 stamens. It may be confused with Common Waterweed (*Elodea canadensis*) and Nuttall's Waterweed (*Elodea nuttallii*), but the leaves of these two native species occur in whorls of 3 or occasionally 4 and have very finely toothed margins (less evident than in Hydrilla).

R.K. Godrey and J.W. Wooten. 1979. Aquatic and Wetland Plants of Southeastern United States: Monocotyledons.
© University of Georgia Press.

AQUATIC
STATUS: LIKELY INVASIVE

Parrot-feather; Water-feather; Brazilian Water-milfoil

Myriophyllum aquaticum
(Vell.) Verdc.
Syn: *Myriophyllum brasiliense* Camb.

Michelle Robinson, Massachusetts DCR

Family: Water-Milfoil (Haloragaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A perennial with relatively stout stems 2-5 m (6-16′) long **that are partially submersed but with portions emersed up to .3 m (1′) above the surface. The emergent leaves are conspicuous and similar to the submersed ones. Feather-like, grayish-green leaves are pinnately split, usually into 20-30 fine linear divisions, and arranged in whorls of 4 to 6 at stem nodes.** In North America, the plants flower rarely and are always pistillate. They occur in the axils of leafy bracts on emergent inflorescences that are similar to the feathery submersed leaves in size and form. Small flowers with four white sepals are later replaced by small axillary fruits (four 1-seeded nutlets) about 2 mm long.

Habitat: Parrot-feather grows in full sun to partial shade in freshwater environments. It occurs in shallow waters and shorelines of ponds, lakes, and slow-moving streams and channels, and is capable of withstanding water fluctuations and high nutrient conditions.

Threat: It is common in the water garden trade and sometimes escapes into local water bodies. Parrot-feather reproduces from fragments and easily forms dense vegetative mats that can impede the growth of native aquatic plants, provide breeding habitat for mosquitoes, and clog waterways. Such growths can interfere with commercial and recreational water activities and are highly expensive to control.

Distribution: In New England, Parrot-feather has been documented in southeastern Massachusetts and Connecticut. **Origin:** South America.

Similar Species: Other water-milfoil species are similar, but Parrot-feather is the only one with conspicuously feathery-leaved emersed stems and inflorescences; the emersed portion of other species is reduced. The Pinnate Water-milfoil (*M. pinnatum*), known only from southeastern Massachusetts, has emersed inflorescences with pinnate, leafy bracts, but the bracts are reduced in size relative to the submersed leaves. Mermaid-weed (*Proserpinaca* spp.) has feathery emersed leaves, but can be distinguished by its alternate leaves and 3-angled nutlets.

Sallie Lou Johnson

AQUATIC
STATUS: INVASIVE

Variable Water-milfoil; Two-leaved Water-milfoil

Myriophyllum heterophyllum Michx.

Leslie Mehrhoff, IPANE

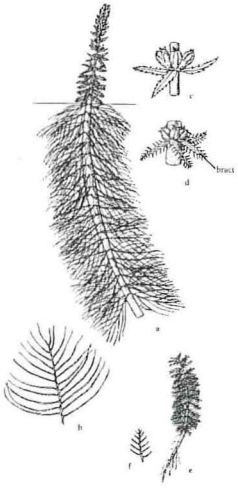
Family: Water-milfoil (Haloragaceae)

Regulated: Importation and propagation/sale prohibited (Jan. 1, 2006)

Identification: A perennial with elongate, much branched, reddish, stout stems and many "whorls" of 5-6 feathery leaves between short internodes; thus it resembles long submerged "raccoon tails." The submersed leaves approximate being in whorls but alternate leaves can be found, especially near the base. Each is about 5-6 cm (2″) long x 2.5 cm (1″) wide with 12-28 pinnately arranged, fine linear divisions. **Emergent flowering spikes extend 10-15 cm (4-6″) above the surface and possess stiff, ovate to lanceolate bracts with minutely serrate or comb-like lobed margins. The bracts are usually two or more times as long as the flowers or fruits.** The small flowers have translucent petals and 4 stamens. Fruits are about 1.5 mm long with rounded segments and warty surfaces. **Winter buds form in the fall at the base of the stems or on rhizomes.**

Habitat: Variable Water-milfoil occurs in a variety of habitats, including rivers, streams, lakes, ponds, swamps and mud flats. It can grow terrestrially or in water up to 5 m (15′) deep.

Threat: It forms dense vegetative mats that degrade water quality for fish and other aquatic species. Spreading rapidly from fragments, it congests waterways and crowds out native aquatic plants. It interferes with activities such as boating, swimming and fishing.



New Hampshire Agricultural Experiment Station, University of New Hampshire.

Distribution: Variable Water-milfoil occurs in all regions of Massachusetts and is present in all other states of New England except Vermont. **Origin:** Southern United States.

Similar Species: Other Water-milfoils with whorled leaves resemble this species. Eurasian Water-milfoil (*M. spicatum*) and Northern Water-milfoil (*M. sibiricum*) have more widely spaced leaves and pistillate bracts less than twice as long as the flowers or fruits. Truncate upper leaves, swollen stems below the inflorescence, and lack of winter buds also separate *M. spicatum*. In Whorled Water-milfoil (*M. verticillatum*) the pistillate bracts are prominently toothed and comb-like throughout, the fruits are larger (2-2.5 mm long), and club-shaped winter buds are formed on the stem proper.

AQUATIC
STATUS: INVASIVE

Eurasian or European Water-milfoil; Spiked Water-milfoil

Myriophyllum spicatum L.

Alison Fox, U of FL, in Bargeron, C.T. et al. 2003. Invasive Plants of the Eastern U.S. CD-ROM.

Family: Water-milfoil (Haloragaceae)

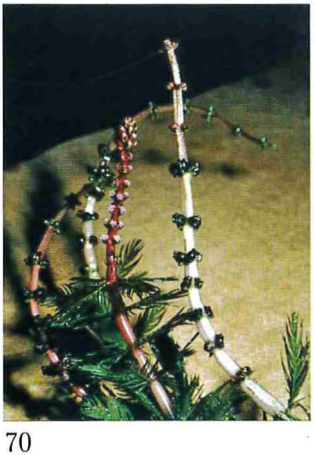
Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: A **perennial with branching stems** up to 6 m (20′) long **forming dense submerged mats and curved apices that lie on the surface. Stems are usually red near the apex but vary from green to red, brown or whitish pink; they are 2x as thick below the inflorescence as at the leafless stem base. Leaves are in whorls and feather-like, each with 12-20 pairs of thread-like segments. The uppermost leaves are often truncate, as if cut by scissors at the apex.** Winter buds are absent. Whorls of small, reddish, 4-parted, 8-stamened flowers appear in the axils of short-bracted spikes projecting 5-10 cm (2-4″) above the water. The bracts are inconspicuous; only the lower ones exceed the flowers. Fruits are roundish, 4-lobed warty-surfaced structures.

Habitat: Eurasian Water-milfoil grows in placid or running water up to 5 m (15′) deep. It occurs in alkaline or occasionally acidic lakes, ponds, rivers and streams, as well as in brackish waters. It does well in disturbed or oxygen-poor waters and can tolerate high pollution levels.

Threat: Its thick mats prevent light penetration and impede the growth of native aquatic plants. Decomposing mats reduce oxygen levels and alter water temperatures, making waters unsuitable for fish and other wildlife. Its fragments are spread by boats and water birds. It can interfere with water traffic and recreational activities.

Distribution: Eurasian Water-milfoil is found in all regions of Massachusetts and in all other New England states. **Origin:** Eurasia.



Leslie Mehrhoff, IPANE

Similar Species: It resembles several other Water-milfoils with whorled leaves. Whorled Water-milfoil (*Myriophyllum verticillatum*) and Variable Water-milfoil (*M. heterophyllum*) typically have bracts more than twice as long as the pistillate flowers or fruits, and both develop winter buds. Northern Water-milfoil (*Myriophyllum sibiricum*) is similar, but the stems are not swollen below the inflorescence, the middle leaves have 11 or fewer segments on each side of the stem, the uppermost leaves are rounded at the apex, and the stem tips are usually green or whitish.

AQUATIC
STATUS: LIKELY INVASIVE

Lesser Naiad; Brittle Water-nymph

Najas minor Allioni

Family: Water nymph (Najadaceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: An **annual with delicate, thin stems** about 10-20 cm (4-8″) long. **Leaves** are slender (0.5-3.5 cm long & 0.1-1.2 mm wide) and **arranged oppositely or sometimes in whorls; they have minute multicellular serrated teeth on the margins (7-15 on each side of blade) that are visible to the eye but best observed with a handlens.** The apexes of the leaf sheaths are nearly truncate or ear-shaped and finely toothed. **The leaves become stiff and recurved with age.** Plants produce 1-2 tiny, sessile, flowers per axil. Flowers are unisexual but both pistillate and staminate flowers are typically present. **Seeds are purplish and spindle-shaped with a curved axis, and have broad 4-angled pits arranged in ladderlike rows.**

Habitat: Lesser Naiad grows mainly in alkaline freshwater habitats up to 15′ deep. It can be found in lakes, ponds, reservoirs and gently flowing streams.

Threat: It forms dense mats, choking shallow water bodies and waterways. Its brittle nature allows it to break apart, disseminating fragments to new areas. Unwittingly spread by humans or introduced through aquaria dumping, it has yet to pose a severe threat to aquatic habitats in most of New England, but any alkaline waters should be watched.

Distribution: In Massachusetts, Lesser Naiad is currently found only in Berkshire County. Elsewhere in New England it has been documented from Connecticut, New Hampshire and Vermont. **Origin:** Eurasia.

Similar Species: The native *Najas gracillima* is probably the most similar of the three other *Najas* species occurring in Massachusetts, but its leaves are ascending to spreading (not recurved) and more finely toothed (barely seen with a hand lens). Also, its seeds have a straight axis, and the pits in the seedcoat are longer than broad. The other two species (*N. flexilis*, a native, and *N. guadalupensis*, an invasive) have leaf blades with 20 or more minute, unicellular teeth and leaf sheaths that taper gradually into the leaf blades.

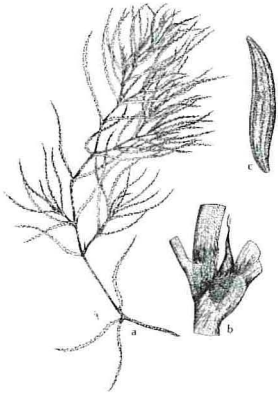


Photo: Robert H. Mohlenbrock @ USDA-NRCS PLANTS Database / **USDA NRCS. 1995.** *Northeast Wetland Flora: Field office guide to plant species.* **Northeast National Technical Center, Chester, PA.**

Illustration: R.K. Godrey and J.W. Wooten. 1979. Aquatic and Wetland Plants of Southeastern United States: Monocotyledons. © University of Georgia Press.

AQUATIC
STATUS: LIKELY INVASIVE

Yellow Floating Heart

Nymphoides peltata
(Gmel.) Kuntze

Bill Byrne, *MassWildlife*

Family: Buckbean (Menyanthaceae)

Regulated: Importation and propagation/sale prohibited (Jan. 1, 2006)

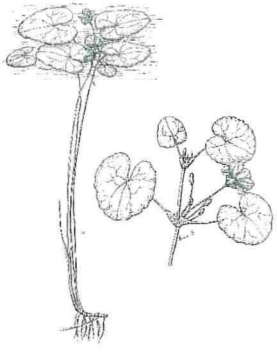
Identification: A coarse, branching, rhizomatous and creeping perennial with nodes at the tips of petiole-like stems bearing 2 or more petioled leaves and commonly one or more short branches. The rounded petioles lack fleshy, banana-like clusters of spur-roots, a feature of some related species. Nearly round or heart-shaped leaf blades are 5-15 cm (2- 6″) long and equally wide with **a notch about 1/3 the blade length. The blade margins are entire, coarsely wavy or slightly toothed. A single, 5 stamened, pediceled flower or multiple flowers in an umbel arise from leaf axils.** Five-lobed corollas are bright golden yellow, 2-3 cm (1″) across and somewhat fringed. Beaked capsules up to 2.5 cm (1″) contain flat seeds with narrowly winged fringe-like margins.

Habitat: Yellow Floating Heart grows in full sun to partial shade, flowering all summer in freshwater environments, particularly shallow, muddy, still bodies of water, e.g. lakes and ponds. Many populations in natural areas represent escapes from cultivated water gardens.

Threat: This species can develop dense floating mats that crowd or shade out native aquatic plant species. It is able to reproduce from fragments. Though it has yet to become a serious problem in New England, it is capable of blocking waterways.

Distribution: It occurs in central Massachusetts and has been reported from every state in New England with the exception of Maine. **Origin:** Eurasia.

Similar Species: A native Floating Heart (*Nymphoides cordata*) and non-native Big Floating Heart (*Nymphoides aquatica*), have white corollas and clusters of tuberous roots along the petiole. Yellow Pond-lily or Spatterdock (*Nuphar variegata*) and its smaller relative, *Nuphar microphylla* (Endangered in Massachusetts) resemble Yellow Floating Heart, but have cup-like flowers with numerous thick, yellow petals and stamens, plus petioles that are flattened above (helping to distinguish their smaller leaf blades from *Nymphoides*). Mature leaf blades of *Nuphar* and *Nymphaea* (water-lilies) will not be wavy or slightly toothed as in *Nymphoides*.



Crow, G.E. and C.B. Hellquist. 1999. Aquatic and Wetland Plants of Northeastern North America. Vol. 1. © Reprinted by permission of The University of Wisconsin Press

AQUATIC
STATUS: INVASIVE

Crisped Pondweed; Curly Pondweed

Potamogeton crispus L.

Leslie Mehrhoff, IPANE

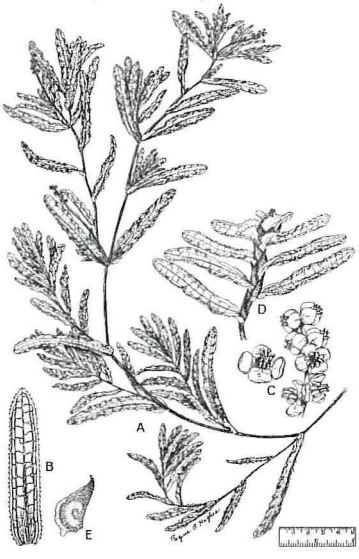
Family: Pondweed (Potamogetonaceae)

Regulated: Importation and propagation/sale prohibited (Jan. 1, 2006)

Identification: A submersed perennial with branching flattened stems up to 100 cm (>3′) long. Linear-oblong leaves (3-9 cm long x 4-10 mm wide) with blunt tips are spirally arranged around the stem. **Leaves are submersed, light to dark green, and have finely toothed margins that become irregularly curled (crisped) and wavy (undulate) in maturity.** Cylindric spikes of flowers, and later reddish-brown, flattened fruits with slightly curved beaks, are emergent on terminal stalks. It flowers and fruits in late spring to early summer, then dies, leaving behind fruits and hardened vegetative reproductive structures (winter buds) that produce new plants in late summer to early fall. This new growth persists through the winter, at times below the ice, flowering and fruiting the following spring.

Habitat: Crisped Pondweed is tolerant of fresh or slightly brackish water and is typically found in high nutrient, eutrophic or alkaline environments. The plant is able to tolerate low light conditions and low temperatures. It occurs in lakes, ponds, rivers, streams, and estuaries.

Threat: It forms dense vegetative mats on water surfaces that inhibit the growth of native aquatic species. It overwinters under the ice, providing a competitive advantage in the early spring. As it dies back in summer months, its decay can cause eutrophication. Surface mats may interfere with boating and other water activities.



Distribution: Crisped Pondweed occurs in all regions of Massachusetts except Cape Cod, Martha's Vineyard, and Nantucket, and has been documented in every state of New England. **Origin:** Eurasia, North Africa and Australia.

Similar Species: White-stemmed Pondweed (*Potamogeton praelongus*) may also have curled or wavy leaves, but the margins are entire. Variable Pondweed (*P. gramineus*), Leafy Pondweed (*P. epihydrus*) and Spotted Pondweed (*P. pulcher*) are somewhat similar, but all have floating leaves as well as submersed ones, and all three lack toothed leaf margins.

Reed, C. F. 1970. *Selected Weeds of the United States*. Agriculture Handbook No. 366. Agric. Research Serv., USDA, Washington, DC. (reprinted in Godrey and Wooten)

AQUATIC
STATUS: INVASIVE

Water-chestnut; Water-nut; Water-caltrop

Trapa natans L.

Bill Byrne, MassWildlife

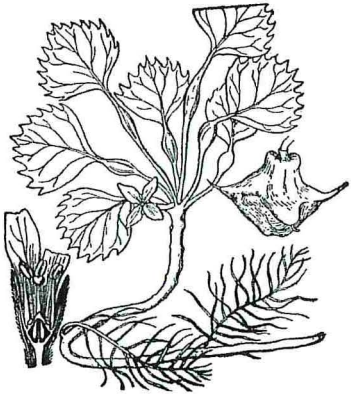
Family: Loosestrife (Lythraceae)

Regulated: Importation and propagation/sale prohibited (January 1, 2006)

Identification: An **annual with a submersed stem** 3-5 m (12-15′) long and **slender roots anchored in bottom sediments. Plants form a rosette of alternate leaves at the water's surface. The floating leaf blades are rhombic-shaped with saw-toothed edges** in the apical portion and entire margins along the broadly wedge-shaped bases. The blade undersides have stiff-hairs and are prominently veined. Elongate petioles are inflated near the middle. Submersed feather-like leaves grow in twos or threes at long intervals along the stem. Small flowers with four white petals appear in the axils of the floating leaves in the summer. **Fruits are woody, nut-like structures 3-4 cm (1-2″)wide and armed with 4 horn-like spines (a caltrop).** A single seed is produced in each caltrop, which is initially green but turns brown with age.

Habitat: Water-chestnut occurs in aquatic habitats ranging from lakes and ponds to rivers and streams. It is typically found in placid, nutrient-rich lakes and rivers. The plant may also occur in exposed mud flats or estuarine environments.

Threat: Water-chestnut can form dense floating mats that reduce light availability to other aquatic species. It competes with native vegetation and may reduce water oxygen levels resulting in fish kills. Fruits spread by floating freely or by clinging to waterfowl, mammals or floating vegetation. Seeds may remain viable for up to 12 years. Infestations interfere with recreational activities such as boating, swimming and fishing.



Distribution: Initially introduced to eastern Massachusetts, it has now spread to all but the southeastern portion of the Commonwealth. In New England it also occurs in Connecticut, New Hampshire, and Vermont. **Origin:** Eurasia.

Similar Species: It is unlikely that any native aquatic species in New England should be confused with this invasive, although the submersed leaves resemble those of milfoils (*Myriophyllum* spp.).

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Glossary

Achene: a small, dry, hard, seed-like fruit that contains a single seed

Alluvial: area where soil or sediments are deposited by river or other running water

Alternate: leaves that occur singly along the stem as opposed to in pairs or whorls

Annual: a plant that completes its life cycle in 1 year including seed germination, flower, setting seed, and dying

Anther: enlarged terminal pollen-bearing portion of the stamen

Aril: fleshy, often brightly colored, tissue covering some seeds

Awn: bristle-like structure; often associated with grass flowers

Axil(lary): the point where the leaf base or leaf petiole meets the stem

Basal: at the base

Bract: a specialized leaf, often reduced in size and at the base of a flower or inflorescence

Biennial: grows vegetatively for the first year, then flowers and dies the next

Calyx: all of the sepals of a flower, collectively

Ciliate: with a fringe of marginal hairs

Colluvial: area where material has been deposited under the influence of gravity (e.g. rock or other loose deposits at the base of a cliff or slope)

Compound: a leaf divided into a number of leaflets

Corolla: collective term for flower petals

Corm: a short vertical underground stem (food storage)

Corymb (corymbose): a flat-topped inflorescence with outer flowers on longer pedicels compared to the inner flowers; central flower is the youngest

Cyme: a flat- or round-topped (or scorpioid) inflorescence where the central (or upper flowers) are older and the outer (or lower) flowers are youngest

Deciduous: all leaves shed each year

Disk: the central tubular flowers in a flower in the Aster family

Eutrophication: water pollution caused by excessive plant nutrients (e.g. nitrogen or phosphorous) or vegetation

Floret: a little flower or an individual flower in a cluster

Fruit: the mature ovary of a plant containing seeds

Genotype: specific genetic make-up (genome) of an individual

Glabrous: smooth, no hairs

Glaucous: covered in a waxy, bluish green coating

Glume: one of a pair of bracts, found at the base of a grass spikelet, that is not under a flower

Inflorescence: the arrangement of flowers on a plant, often a cluster of individual flowers

Internode: section of stem between two nodes

Lanceolate: lance-shaped or tapering from a rounded base to an apex; like ovate, but narrower

Leaflet: a unit of a compound leaf

Lemma: one of a pair of bracts that is underneath a flower in a grass spikelet

Lenticil: a slightly raised area (small pore) in the bark of a stem or root that permits the interchange of gases between interior plant tissues and the surrounding air

Ligule: literally a little tongue, appendage at junction of leaf and sheath in Grass and Sedge families

Native: plant species naturally occurring in a given range, not introduced to an area by humans

Node: place of attachment of leaf to stem

Oblanceolate: like lanceolate, but broadest above the middle and tapering to the base

Obovate: egg-shaped but connected at the narrow end to the leafstalk

Opposite: leaves occurring in pairs, with one leaf on either side of the stem

Ovate: shaped like a long-section through a hen's egg, with the larger end toward the base

Palmate: radiating out from central axis

Panicle (paniculate): an open inflorescence, where the main branches are again branched; flowers mature at the base first, then upwards

Pedicel: stalk that bears a single flower

Perennial: living 2 years or longer

Petiole (petiolate): leaf stalk

Pilose: with sparse spreading straight hairs

Pinnate: arranged on opposite sides of a central axis or stem; i.e., a column of leaflets or veins on each side

Pistil (pistillate): the female organ of a flower, including ovary, style and stigma

Pith: a central tissue in a stem or root that is surrounded by a cylinder of vascular tissue

Pubescent: covered with short downy hairs

Raceme: an unbranched flower cluster where each flower is attached by its stalk directly to the central stem; maturing from the base upward or outward

Ray: the flat tongue-shaped flowers of a flower in the Aster family

Rhizome (rhizomatous): underground stem that grows horizontally that can send up new shoots

Rosette: radiating cluster of leaves at ground level

Samara: closed dry fruit with wings

Seed: fertilized ovule with a hard coat, embryo and sometimes endosperm (food storage for embryo)

Sepals: one of the separate, usually green, petal-like units of the calyx of a flower

Septum: a partition in an ovary

Sessile: attached directly by the base, without a stalk or petiole

Sheath: leaf base surrounding the stem

Stamen (staminate): the male organ of a flower

Stigma: the part of a pistil that is receptive to pollen

Stipules: one of a pair of basal appendages found in association with leaves of many species

Stolon (stoloniferous): creeping elongate stems on the surface of the ground

Simple: only one, or not divided

Subopposite: not quite opposite

Spathes: a large bract below and often enclosing the inflorescence

Spatulate: shaped like spatula, rounded above and narrowed to the base

Spike: unbranched inflorescence with flowers without pedicels (sessile)

Spikelet: a small prolonged spike subtended by one or two bracts (in grasses and sedges)

Stamen: male sex organ of a flower that produces pollen; composed of anther and filament

Style: the slender stalk that connects the stigma(s) to the ovary

Truncate: straight or flat-based as if cut off

Umbel: a flower cluster where single flowers grow on stalks, all from the same point

INVASIVE PLANT WEB SITES

Organization/Program	Web Site	What You'll Find
MA Coastal Zone Management Program: Aquatic Invasive Species Program	http://www.mass.gov/czm/invasives/index.htm	Management Plan, resources on prevention and control
MA Div. of Fisheries and Wildlife: Natural Heritage & Endangered Species Program; Habitat Grant/Assistance Programs	http://www.mass.gov/dfwele/dfw/nhesp/nhesp.htm http://www.mass.gov/dfwele/dfw/habitat/grants/habitat_grants.htm	Information on invasive & native plant species in State, Grants and assistance programs
MA Invasive Plant Advisory Group	http://www.massnrc.org/MIPAG	Strategic recommendations with MA invasive plant list
MA Dept. of Conservation & Recreation: Lakes and Ponds Program	http://www.mass.gov/dcr/waterSupply/lakepond/lakepond.htm	Info about State services for managing aquatic invasive plants and weed watchers volunteer program
MA Dept. of Agriculture	http://www.mass.gov/agr/farmproducts/Prohibited_Plant_Index2.htm	Plant species prohibited from importation or sale in State; nursery inspection regulations
MA Nursery and Landscape Association	http://www.mnla.com	Information on invasive species and landscaping alternatives in State
The Nature Conservancy: Global Invasive Species Team	http://tncweeds.ucdavis.edu	Methods of control for invasive plants; weed control handbook
New England Wildflower Society	http://www.newenglandwild.org	Invasive plant publications, volunteer & management projects
Cornell University Ecology and Management of Invasive Plants Program	http://www.invasiveplants.net/	Species fact sheets, biocontrol research projects
Plant Conservation Alliance, Weeds Gone Wild	http://www.nps.gov/plants/ http://www.nps.gov/plants/alien/	Native plant landscaping; Fed. Interagency, email listserve, alien plant info, habitat restoration
USDA, PLANTS Database	http://plants.usda.gov/	N. American flora, Fed. & St. noxious or US invasive weed lists, links
USDA National Agricultural Library: National Invasive Species Information Center	http://www.invasivespeciesinfo.gov/	Information on Federal, State, Local and International invasive programs
Fed. Interagency Comm. For Management of Noxious & Exotic Weeds	http://www.fws.gov/ficmnew/	Federal initiatives, planning & funding for invasive weed management.
APHIS, Federal Noxious Weeds Program	http://www.aphis.usda.gov/ppq/weeds	Noxious weed list, permits for weed & biocontrol agents, Tech. Advisory group for biocontrol
USDA, Forest Service, Northeastern Area	http://www.na.fs.fed.us/fhp/invasive_plants/index.shtm	Field & Ref. Guide, Weed of the Week, Early Detection, Prevention, Restoration, Publications
USDA, Forest Service, State & Pvt. Forestry, Durham, NH	http://www.fs.fed.us/na/durham/coopforest/stewardship/text/invasivess.shtml	"Control of Nonnative Invasive Plants on Your Woodlot"
Invasive Plant Atlas of New England (IPANE)	http://nbii-nin.ciesin.columbia.edu/ipane/	Map distribution & collection data, sighting form
Center for Plant Conservation	http://www.centerforplantconservation.org/invasives/	Voluntary Codes of Conduct for Govt.,Nursery Prof. & Gardening Public

Yellow Iris by Lois Somers

EXECUTIVE OFFICE of ENERGY & ENVIRONMENTAL AFFAIRS

NEW ENGLAND WILD FLOWER SOCIETY

The Nature Conservancy

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NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM

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